DR. K. M. NADKARNI'S

# INDIAN MATERIA MEDICA

---

*Third Edition*

DR. K. M. NADKARNI'S

# INDIAN MATERIA MEDICA

*With Ayurvedic, Unani-Tibbi, Siddha, Allopathic, Homeopathic, Naturopathic & Home Remedies, Appendices & Indexes*

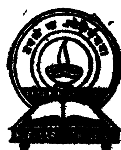
(Originally edited by the late Dr. K. M. NADKARNI, F.S.SC., L.A., (Lond.): M.C.S. (Paris) M.BR.PH.C. (Lond.) etc.)

Third Edition

Revised & Enlarged by

**A. K. NADKARNI**

IN TWO VOLUMES · VOLUME TWO



**POPULAR BOOK DEPOT**
**BOMBAY 7**
**BHOOTAPAPESHWAR PRAKASHAN LTD.**
**PANVEL**



Printed by G. G. Pathare at Popular Press (Bom.) Ltd., 35, Tardeo Road, Bombay 7 and Published by G. R. Bhatkal, jointly for the Popular Book Depot (Regd.), Bombay 7 and Dhootapapeshwar Prakashan Ltd., Panvel.

# CONTENTS

## VOLUME TWO

INDEXES

*"To be a Physician is to my mind the grandest thing in the world. A good physician is a God-send in any community and a blessing in the consulting room."*

—Dr. Jones, M.D., D.Sc., Ph.D.

* * *

*"There is neither East nor West, nor Border, nor Breed, nor Birth, when too strong* Forces of Civilisations and Cultures *stand face to face, tho' they come from the ends of the earth".*

—Dr. Walter Eugene Clark, Ph.D.,
Prof. of Sanskrit in the University of Chicago

* * *

*"We live in times of a New Renaissance. Old values, ancient traditions and out-dated concepts are crumbling fast under the impact of a changing world. Thinkers exhort all to think and act in terms of a greater humanity, to raise above the mean limitations that cripple our growth and retard our progress, to consider everything and being as our brothers, irrespective of all accidents of birth and conspiracies of circumstances. And, in all things that affect us to gaze at new horizons and 'hitch our wagons to the stars'. Humanity is one! Truth is real! Culture is our food and drink—Unity and Progress through Culture!!!".*

THE

# INDIAN MATERIA MEDICA

## PART II

---

## (MINERAL KINGDOM)

---

### 1. ADAMAS

*Sans.*—Heeraka; Hirakam; Vajra. *Eng.*—Diamond. *Fr.* Diamant. *Pers.*—Almas. *Hind. Ben. & Mah.*—Heera. *Tel.*— —Bajar. *Mal. & Tam.*—Vairam; Vayaram. *Can. & Kon.*— Vajra.

Source.—Obtained from mines, formerly from Golconda (Deccan); now mostly from Johannesburg in South Africa.

Characters.—A gem of the most valuable kind consisting of pure carbon and remarkable for its hardness and clear transparency and brilliance.

Classification.—It is divided into classes according to its colour and form:—The *white* coloured; the *red* coloured; the *yellow* variety; the *black* variety. The *round sized* one with high gloss and line or spot is termed *male.*

Purification & Preparation.—Diamond is purified by being enclosed within a lemon and boiled in the juice of the leaves of Agati grandiflora. It is reduced to powder thus. —A paste is made of the root of a cotton plant with the juice of some betel leaves, *both the vegetables being not less than three years old.* The diamond is then enclosed within this paste and roasted in a pit of fire. This process is repeated seven times, when the stone is easily reduced to a fine powder. Another process consists in roasting the diamond enclosed in a paste made of horn-shavings for three times in succession;

it can also be purified after having it beaten with horse's urine and then cooking it in the *putapaka* process.

Action.—Diamond thus prepared is a powerful alterative, tonic, stimulant, improves nutrition, increases the strength and firmness of the body and removes all sorts of diseases. Dose is about 1 grain. It generates the secretion of semen and is always preferred for medicinal purposes. For internal administration prepared or purified *white* diamond is preferred, the *red-colored* is beneficial in various diseases and prevents premature death. The *yellow* variety gives strength. The *black* variety is also beneficial in several ailments.

Uses.—Diamond forms an ingredient of several alterative and tonic medicines such as *Trailokya Chintamani Rasa, Ratnagiri Rasa, Sarvangasundara Rasa* etc. which contain besides diamond, pearls, gold, iron, talc, mercury, etc., in varying proportions and are used in similar cases. *Trailokya Chintamani Rasa* contains diamond, gold and pearls one part each and iron, talc and *Rasa Sindura* 4 parts each, rubbed together with the juice of Aloe indica and made into two grain pills. Another preparation called by the same name contains the above ingredients *minus* iron and also prepared coral, orpiment, realgar and aconite. It is useful in gastric disorders, general debility, asthma, phthisis, diarrhoea, colic, anaemia, sexual debility etc. Dose is 1 to 3 pills of one grain each, three times a day.

---

## 2. ALUMEN

*Sans.*—Sphatikari; Surashtraja; Kamakshi; Tuvari. *Eng.*—Alum; Sulphate of Alumina and Potash or of Aluminium and Ammonium; Aluminous sulphate. *Pers.*—Shab-i-yemeni; Zake bilor; Zake-safed. *Arab.*—Shabb-Zaje-abyaz; Zaj. *Hind.*—Phitikhari; Phitkari. *Ben.*—Phatkiri. *Bom.*—Sambe-mani. *Guj. & Duk.*—Phatkari. *Mah.*—Turati; Phatki. *Tam.*—Patikaram; Padikharam; Shinacarum. *Tel.*—Pattikaramu; Padikharam. *Can.*—Phatikara. *Sinh.*—Shina-karan. *Burm.*—Khin; Kyouh-kyen; Keo-khin. *Malay.*—Tawas.

Source.—Chiefly found with peroxide of iron in Silajit or in Alum earths of Nepal or prepared from the alum shales in the Punjab, Rajputana, Bihar and Cutch States. As found in the bazaars, it is often mixed with impurities; it may be rendered fit for medicinal purposes by dissolving it in boiling water, straining the solution and evaporating it so as to obtain crystals, which should be preserved for use. Alum is a general name for a class of double sulphates containing aluminium and such metals as potassium, ammonium, iron, etc.

Characters.—Colourless, transparent crystals, with acid, sweetish astringent taste.

Action.—Astringent, caustic, haemostatic, antispasmodic and antiseptic; irritant and purgative in large doses; emetic in repeated doses. It constringes small vessels and organic fibres and thus acts in diminishing the exhalations, secretions and supply of blood to a part.

Uses.—It is useful in leucorrhoea, haematuria, haemoptysis, menorrhagia, gastric and intestinal catarrh and other haemorrhages; in fluxes of the respiratory passages with profuse ropy mucous phlegm; in chronic diarrhoea and dysentery and in atonic discharges generally. In chronic diarrhoeas, a mixture containing 10 grains of alum, 5 drops of laudanum and 1½ ounces of infusion of acorus root, given thrice daily is useful. In the diarrhoea preceding cholera and in the diarrhoea of phthisis, a compound powder of alum, catechu and cinnamon each 10 grains mixed with honey is given in repeated doses. It is useful also in strangury and vomiting in small doses *i.e.,* 2 to 10 grains. Ten grains of it arrests the spasms of asthma. In narcotic poisoning in children it is a good and efficient antidote. In whooping cough, after the first or acute stage has passed, alum in doses of 2 to 4 grains according to age of the child, given twice or thrice a day, in the form of *powder* or in *solution* in Omum water (1 in 60) in doses of a teaspoonful to a dessertspoonful for a child from 1 to 4 years old, given thrice a day is most beneficial. For asthma and cough alum 5 grains in half an ounce of rose water is given twice a day. Persons bitten by serpents are made to drink buttermilk or water mixed with 6 *mashas* (72 grains) of good

alum powder—(J. L. Duveji). In obstinate cases of malaria *desiccated alum* in 5 grain doses with some aromatic compound powder to disguise the taste given 2 hours before the expected rigour with only a teaspoonful of water has given very satisfactory results. In injuries which result in concussion of the brain or spinal cord or in severe sprains or fractures the first thing given is alum 5 grains with treacle or sugar. In croup a teaspoonful mixed with honey or syrup is an excellent emetic. In obstinate hiccup one-drachm doses given two or three times a day induce vomiting and stop hiccup. If the powder is taken with very little water there is less likelihood of its inducing vomiting. In frequently repeated doses of 30 grains alum relieves lead colic by precipitating soluble salts of lead. Alum 45 grains mixed with treacle is given internally for guinea-worm. Alum in 5-grain doses thrice a day with the juice of Adhatoda vasica works wonderfully in certain forms of leucorrhoea, especially when the flow is tinged with blood. In haemorrhages from kidneys, uterus and other internal organs alum in doses of 10 to 12 grains thrice daily with or without opium is given with benefit, *but not when much fever is present.* Alum whey or 'lime whey' prepared by boiling for 10 minutes two drachms of powdered alum in a pint of milk and strained is beneficial in doses of ½ to 2 ounces thrice daily in menorrhagia and bleeding piles. "As a haemostatic, its use is recommended in bleeding from the nose and other mucous surfaces."[1] Dr. H. C. Sen has "derived satisfactory results" from alum-whey in cases of enteric fever. It is palliative in diabetes and albuminuria also. Externally, alum forms one of the ingredients of some hair dyes and hair lotions. It is applied in a saturated solution, i.e., 5 per cent in bleeding from the nose, gums, vagina or the rectum; as a styptic, in leech bites, cuts etc.; in prolapsus ani and prolapsus uteri. Locally applied it checks sweats in the armpits, groins and soles of the feet. Weak solution (1 to 2 p.c.) is used as a lotion to ulcers and chilblains; as "an astringent gargle in a strength of 2 drachms to a pint of decoction of gall or *Babul* dark or of plain water"[2] it is used in relaxed or ulcerated sore-throat, aphonia, atony of the larynx, spongy or bleeding gums, loose teeth, ulcers of the mouth and tongue, fissures

of the tongue in consumption, in excessive salivation etc.; it is locally applied in diphtheria, croup and pharyngitis; as a collyrium (preferably mixed with rose-water) it is used in chronic and purulent ophthalmia, chronic conjunctivitis, generally in what is known as country sore eyes, especially among children for whom a solution of 3 to 6 grains to an ounce of distilled water or rose-water is sufficient. Its solution is also used as an injection in gleet and leucorrhoea. "Alum lotion, internally, is administered to check haemorrhage from lungs, stomach, kidneys and other organs or to arrest excessive menstrual flow".[3] In inflammation round the ear, a paste made of alum and gypsum equal parts and *Gile-armani,* (Armenian Bole) is applied; in otorrhoea it may be dropped into the ear. In recent ecchymosis, contusions, sprains etc., *poultices* made of wheat bran and the solution of alum or of 30 grains of powdered alum mixed with the white of an egg are highly useful; the latter are useful chiefly in cases of severe blows on the eye and the consequent pain, heat and swelling. In aphthae and thrush, spongy gums and other affections of the mouth powdered alum with honey, is used with benefit. It is often sprinkled over indolent ulcers, especially chronic umbilical ulcers of infants, and used as a *snuff* in epistaxis; or a *gauze* wet with alum lotion (5 p.c.) is plugged in the nose. Similar alum *plugs* combined with glycerine or alum douches may be used in leucorrhoea. The solution may be used also as a nasal *spray* if the lesion is higher up in the nose. In cases of post partum haemorrhage or menorrhagia, sterilized cotton plugs saturated with alum *powder* or sterilized alum *lotion* (5 p.c.) immediately stop the bleeding. A lotion made of alum and borax 40 grains each and 8 ounces of water is useful in weeping eczema. Alum powder mixed with talc and zinc oxide is a good remedy for sweating feet. A powder composed of alum 1 part and *gile-armani* and Catechu ½ part each, is an application to swollen gums and in toothache. In bleeding piles, cloths saturated with a solution of alum in decoction of galls or of *Babul* bark (in the proportion of 2 drachms of alum to 8 ounces of the decoction) are kept constantly applied to the parts; this is useful in prolapsus of the anus especially in children. A

weaker solution, i.e., of two drachms to the pint of the decoction, forms a useful *gargle* in diseases of the mouth and throat above-mentioned and as useful *injection* in leucorrhoea and other vaginal discharges. In discharges from the urethra, caused by a sore or excoriated surface between the prepuce and the head of the penis often confounded with gonorrhoea, a 4 p.c. solution applied twice or thrice daily is very beneficial. For gleet and urethral stricture, Zad-Garib prescribes for injection a lotion made of alum 1 tola, *Nila tutiya* (blue vitriol) 70 grains and water 1 seer, dissolved by aid of heat, strained and cooled. This is used for urethral injection. In chronic gonorrhoea 1 or 2 p.c. solution with potassium permanganate is used. "In old chronic, spreading and gangrenous ulcers an application made of finely powdered alum 4 drs., finely powdered catechu 1 dr., opium ½ dr., and ceromel or *Kokum* butter or ghee 1 or 2 ounces, applied on a soft rag, night and morning is very excellent".[4] For bed sores or where these are likely to occur, a mixture of 30 grains of burnt alum and the white of an egg, is painted over the part. For traumatic swellings and enlargement of the joints especially that of the knee and for other swellings from blows, bruises or sprains, cloths wet with the lotion of alum 4 drs., vinegar and *Arrack* 1 pint each, are kept applied to the affected part. In scorpion and insect bites, alum moistened with water and locally applied affords instantaneous relief.—(Dr. Saunders-Waring).

(1), (2), (3) and (4)—Chopra's "I. D. of I." pp. 563/564.

---

## 3. ALUMEN EXSICCATUM

(Dried or burnt alum) is used as an astringent and caustic to check unhealthy granulations; used in indolent ulcers and and ulcerative stomatitis.

---

## 4. ALUMINII SILICAS

(*Sans.*—Kharyamitti. *Eng.*—Felspar; Clay; Silicate of Alumina. *Hind.*—Chikni or Sufaid mitti; Lang-i-dalam. *Duk.*—Khar; Dhoi-huvi-khari. *Pers.*—Kadi; Gilsufeid. *Guj.*—Khadu.

*Tam. and Tel.*—Namon. *Mal. and Can.*—Nama) under peculiar circumstances and by the action of the Carbonic acid gas of the air suffers after a long time complete decomposition and is converted into a soft, friable mass of earthy matter resembling soft mortar. When the decomposing rock contains, besides felspar, oxide of iron, the clay produced is iron-coloured. The dark appearance of some clay is due to its containing bituminous matter. Prepared or purified pipe-clay is used in medicine as a dusting powder.

---

## 5. GOPICHANDAN

(*Sans.*—Shoraktri. *Hind.*—Pani-soka. *Ben.*—Sugandamitti) is so named from a lake called Gopi, near Dwarka, wherefrom it is taken. It is a kind of clay—a manganesium iron and an aluminium yellow earth found in pieces of various shapes. Its smell resembles that of *Multani mati,* another kind of clay. Water poured upon it is soon absorbed. It is used as an absorbent powder dusted on unhealthy ulcers and wounds. It is cooling and desiccant. It is applied with rose-water, as a paste, to the forehead to relieve headache, and also to inflamed boils.

---

## 6. KAOLINUM

(*Sans.*—Gairika; Krishnamrittika. *Eng.*—China clay; Kaolinite; Kaolin; Porcelain clay; Red ochre. *Ben.*—Girimati; Gainika. *Hind.*—Chikmimati; Geru. *Sinh.*—Kiramatti) is a native white aluminium silicate found in Ceylon, China etc. It is obtained by purifying native white felspar or aluminium silicate by elutriation which removes silica and undecomposed felspar. It is thus converted into a soft, friable, whitish earthy mass. It is pulverizable, insoluble, in water or in dilute acids. Pure Kaolin contains alumina 70, silica 26, and iron oxide 4 p.c. It has been in medicinal use since the earliest dawn of medical history. Discorides of Cilicia, who lived about the dawn of the Christian Era, describes five different kinds of clay in medicinal use in his materia medica. Galen attributes its discovery to Hermes Trismegistes, the teacher of Aesculapius. Avisenne, most famous of Arab physicians (980 to

1039 A.D.), describes the various kinds of clay in medicinal use in his era. In the middle ages it came to be extensively used for all sorts of complaints, such as epilepsy and cardiac diseases, and *not unnaturally fell into disrepute under such improper usage.* Subsequently in slight demand as an excipient for pills and pastes, it has remained for Stumpf of Wurzburg in 1898 to almost re-introduce this valuable medicament to the profession. His attention to its value was first drawn by noting in 1882 that a corpse which had been buried for 37 months, and which was then exhumed for medico-legal examination, had been buried in a clay soil and was in a most extraordinary state of preservation. In 1886 he commenced to use clay as a paste in the treatment of old standing septic wounds with most gratifying results as to deodorisation, protection from irritation, and healing. In 1900 Stumpf began the internal treatment of cases of cholera, dysentery, diarrhoea and septic wounds by oral administration of kaolin. During the period after the Treaty of Bucharest when the Serbian armies returned to their homes, Dr. Kuhne was in charge of a cholera camp in Belgrade and also of a similar one at Nish. During this period Dr. Stumpf came to Dr. Kuhne and begged to be allowed to treat the cholera cases with kaolin. Cases which were apparently desperate were handed over to him, with the result that next day they were not dead, but recovering. Persevering in this line of treatment, the mortality in these cholera camps dropped from 44 p.c. to 3 p.c.! *It proved far more efficacious than injections of anti-serum, injections of iodine, or hypertonic saline treatment. Also it was far more practicable.* Dr. Kuhne writes that he has now adopted kaolin treatment in all general cases of intestinal disorder in place of bismuth, charcoal, talc etc. In the treatment of cholera, the following prescription is advocated.—Into 250 c.c. of cold boiled water pour 100 gms. of finely pulverised kaolin. This is shaken until a perfectly homogeneous, yellow-white creamy liquid is obtained. A tumblerful of this mixture is given to the patient orally every half hour or every hour to six or more doses. As a rule, after the sixth dose the patient falls asleep and all acute symptoms are over. The treatment is continued with smaller dosage over the next few days and the patient should

be able to leave hospital in from 5 to 10 days' time. If it should prove impossible to administer the emulsion by the mouth it may be given by the stomach tube or by enema,—giving at least three litres of the suspension per dose in the latter case. *When making the emulsion the kaolin should always be added to the water, and not vice versa.* Other accessory treatment the author considers to be superfluous. For the first 18 hours after the admission nothing else should be given by the mouth except plain cold water. The advantages of kaolin treatment—if it be as successful as the author claims (says the Indian Medical Gazette, Feb. 1926) are obvious. It can be administered by any one, even by the patient himself; accurate dosage is not necessary; in an hour a medical attendant can deal with a hundred patients; the treatment is not painful, is free from danger, and requires no special appliances; it can be used as a prophylactic measure; it is equally applicable to all forms of diarrhoea and dysentery; lastly it is very cheap. *Should the true diagnosis be choleraic diarrhoea and not true cholera, only good and not harm is done.*

Kaolin probably owes its value to (a) absorption on the surface of its fine molecules of toxins; thus, it is of great value in cases of food poisoning also; (b) its mechanical protective coating of the acutely inflamed gut. Finally, the range of therapeutic application of kaolin is not confined to intestinal disorders, and in relieving bleeding from internal organs; it is of value in infantile diarrhoea; as a local application in diphtheria of the throat and on burns; for local treatment in leucorrhoea and in vaginal and uterine inflammation and lastly, for disinfection of the surgeon's hands before operation, where thorough rubbing of the hands with purified kaolin will—it is believed—remove all septic infection from the skin without causing the irritation of the skin so common with the use of the usual surgical antiseptics! "Personally" says the editor of the Gazette "we have now been using kaolin in the treatment of intestinal disorders for some two years—especially in the treatment of bacillary dysentery. Morson's electrically precipitated "Osm o-kaolin" is probably the best preparation. It may be said that such treatment is exceedingly well tolerated by the patient; is often very successful from a clinical point of view; and is a

measure of distinct therapeutic value. The usual dose given is 2 drachms suspended in water or milk every four hours during the acute dysenteric phase". For other uses of kaolin see B.P.

The different kinds of clay are the mineral deposits from the disintegration of felspathic rock. They are, besides Kaolin, as follow:—(1) Red bole or Ochre (*Guj. & Hind.*—Gerumati) is a Silicate of Alumina and oxide of iron; this relieves bleeding from internal organs. (2) Bole Armeniac (*Guj.*—Gule-Armani. *Hind.*—Ghermumitti) is Silicate of Alumina, Magnesia and oxide of iron. This is refrigerant, astringent, absorbent and antiseptic; (3) *Multani Mati* and *Gopichandan* are both varieties of Bole Armeniac; (4) Pipe Clay (*Guj.*—Khadu) above referred to, and (5) Silicate of Alumina, Lime and oxide of iron (*Hind.*—Gill) uses of this are like *'multani mati'*.

A mixture of clay and vinegar is used by peasants in some districts as a cooling local application in fevers. In the treatment of aneurism, in neurosis of the heart and in the treatment of the disagreeable pulsations in hysteria, clay is applied with success; after an application of a *paste* of clay to a pulsatile tumour, not only the subjective conditions as the asthmatic symptom and cardiac pain, but also the objective symptoms namely the pulsation and the volume of the tumour become diminished.—(Prof. Botkin, Dr. Pirogoff and other Russian surgeons). In cases of hysteria, not only the epigastric pulsations become reduced but also the intensity of the other disturbances of the abdominal organs, with the disappearance of the vomiting, diarrhoea and abdominal pains, became notably reduced. In Wologda (Russia) women soothe the pains of hysteria by applying clay to the soles of the feet. Dr. Loueachevitch reports several cases of gonorrhoeal epididymitis promptly cured by the application of white moulding clay of Sculptors made into a paste with water. The dressings are removed twice a day; the swellings are said to subside on the 2nd or 3rd day. Pale or yellow Ochre (*Indian Bazaar:*—Multani mati) is used externally in combination with fresh lemon juice and oil or curd and rose-water for rubbing and

washing head, which removes dandruff, softens the hairs, and keeps the head cool. Pipe clay and ammonium chloride in equal parts made into a paste are applied to the temples in headache.

---

## 7. AMMONII CHLORIDUM or AMMONIUM CHLORIDE

### (See also:—Saline Substances)

(*Sans.*—Navasara; Navasagara; Chulika lavana. *Eng.* —Sal Ammoniac. *Arab.*—Armina; Milhunnar. *Punj.* & *Pers.*—Noshadar. *Kash.*—Nausadan. *Hind.*—Navasadara; Nousadar. *Ben.*—Navasagara. Nishadal. *Duk.* *Guj.* *Mah.* & *Kon.*—Navsagar. *Tam.* & *Sinh.*—Nava-charam; Nava-charum. *Mal.* & *Tel.*—Navasaram. *Burm.*—Lovas; Zarasa) as obtained in the bazaars is generally very impure in dirty white or brownish translucent cakes, "as it is manufactured from a kind of clay found at Karnal in the Punjab".—(Chopra). It is obtained by the combustion of excretions of various animals or of animal matters or by burning coals or common salt. It is a seconday product in the manufacture of coal gas. It is generally obtained in India from unburnt extremities of brick-kilns in which manure of animals, especially camel's dung is used as fuel. To this, coal and common salt are added and sublimed. It is thus obtained in white granular crystals or transparent masses. It is readily soluble in water and is highly deliquescent. It has a saline, disagreeable, nauseous and pungent taste. It can be purified and made into a powder by dissolving in hot water and evaporating to dryness and then bottling. It is alterative, expectorant and cholagogue in small doses; in large doses purgative. It has a marked stimulating action on the mucous membranes, increasing their secretion also on the absorbent system and on gland structures. It relieves hepatic congestion and modifies hepatic secretions; useful is cases of hepatic abscess, chronic hepatic congestion and in dropsy connected with the liver and ovarian diseases; in cirrhosis and in jaundice from catarrh of the bile ducts. For hepatitis, sal-ammoniac 8 to 15 grains, mixed with 105 grains of Absinthium (worm

wood), rubbed well in a mortar with a little water and given in a single dose will give relief (Hakim & Vaidyan). In gastric catarrh in biliousness with coated tongue, foetid breath, flatulence etc., in bronchial and vesical catarrh, in chronic pharyngitis with glairy mucous secretions and whooping cough it is valuable, combined with liquid extract of glycyrrhiza or syrup of Country liquorice and with a few grains of powdered cinnamon, in cases of whooping cough. In amenorrhoea, dysmenorrhoea, gleet, leucorrhoea, chronic dysentery and other similar chronic discharges from lungs, stomach and other internal organs it is given dissolved in *conjee* water (2 drachms to a pint) in wineglassful doses every second or third hour. "In hysteria, nervousness, jaundice and other liver complaints and gastric catarrh, doses of 10-20 grains three times daily are beneficial. It is often prescribed as a stimulating expectorant in chronic bronchitis and in pneumonia in the stage of resolution."—(Chopra). In various forms of neuralgia, in chronic liver diseases, organic or functional, in rheumatic affections of the face etc., it is given in infusion of Indian Sarsaparilla; in intermittent fever, in sick or nervous headaches, acute alcoholism and in delirium tremens its action is very marked, given dissolved in camphor julep. In dropsy due to liver disease and in that following fevers, it is administered with infusion of Moringa or decoction of Astercantha. As an alterative it acts by slowly modifying the nutrition of the tissues; it is a useful agent in chronic inflammatory diseases of the glands such as thyroid body, liver and spleen and in induration of the uterus, ovaries and the prostate and externally for fomentation in the form of a lotion (1 in 80). In urinary diseases chiefly where the urine is full of lithates it is very useful. *Externally* its solution combined with nitre is a nice cooling and stimulant application to the head in headache, "sprains, rheumatism, lumbago, sciatica" (Chopra), mania and apoplexy, and for inflamed erysipelas and hernial tumours; in inflamed hydrocele, indolent tumours, in enlarged glands, in (mammary) milk abscesses occurring after confinement and abscesses in other parts of the body before formation of matter, in chronic skin diseases and as a dressing for bruises and blows on the eye (black eye). For milk abscesses etc., it is used as lotion

with *Arrack* and rose-water (1 in 8 and 160 parts respectively). Mixed with sulphide of arsenic, it is used as an application to scorpion bites. As an *inhalation* in affections of the air passages its vapours produced by heating a drachm of it on a dish, are useful. Ammonium Chloride is recommended for local application in cases of cataract.—(Ilaj-ul-Gurba).

---

## 8. ANTIMONII SULPHIDUM or ANTIMONY SULPHIDE

(*Sans.*—Srotonjana; Sauvira. *Eng.*—Kermes mineral; Black antimony; Sulphide of Antimony. *Ben.*—Surma. *Hind.*—Anjan; Surmaka-patthar. *Arab.*—Ismad; Kohal. *Pers.*—Sagl-surmah. *Guj.*—Surme; Kuhl-anjan. *Duk.*—Anjan. *Mah. & Kon.*—Surmav. *Tam.*—Anjanamai. *Tel.*—Nilanjanam; Katuka. *Can.* Anjana. *Burm.*—Tay-lak-youk) is found in Vizianagram and in several parts of the Punjab. It is a tersulphide of antimony purified by fusion and reduced to a black powder. The powder is used as an application to the eye-lids and eye-brows especially by women in Upper India and as a cosmetic to improve the personal appearance. When thus applied it is supposed also to protect the eyes from the glare of the sun by absorbing the rays. An *Anjan* or Collyrium is recommended by Pdt. J. L. Duveji as a cure for impaired eye-sight, ophthalmia, cataract, itching, redness, irritation etc., in the eyes, in short as a remedy for several eye-complaints. It is prepared thus.—Take half a tola each of borax, purified ammonium chloride, cuttle-fish-bone, saltpetre, *Sang-basri,* alum flower, kernel of Butea frondosa roct, and kernel of mustard seeds and ten tolas of antimony (sulphide) and pestle them well in a mortar for three hours mixing lemon juice. Sieve well after getting them dried in a shady place before filling in phials which should be kept well corked. ***Internally antimony sulphide is seldom used, except occasionally as a tonic for horses.***

---

## 9. ARGENTUM

*Sans.*—Rajata; Rupya; Tara. *Eng.*—Silver. *Fr.*—Arzgent. *Ger.*—Silber; L. Argentum. *Ben.*—Rupa. *Arab.*—Fazzeh;

Faddah. *Pers.*—Nokra. *Hind. & Mah.*—Chandi. *Guj.*—Rupun. *Kon.*—Rupeh. *Tam. & Mal.*—Velli. *Tel.*—Vendi. *Can.*—Belli. *Sinh.*—Peddi. *Burm.*—Ngway.

Source.—Found throughout the mineral kingdom in a metallic state often alloyed with other metals, gold, arsenic, copper etc., or combined with sulphur, iodine, chlorine etc. There were silver mines in Sind, Agra, Delhi and Lahore—(Ain-i-Akbari). In ancient times silver was obtained from galena (lead sulphide) which contains a minute quantity of silver. Even now silver is derived from this source in many places—(Jour. Ayur. Feb. 1926).

Characters.—A soft, white, brilliant and ductile metal; it does not oxidize when exposed to the air, but is soon tarnished by vapours of sulphur. It is purified in the same way as gold.

Preparations.—Silver leaf is prepared like gold leaf; *Tara Bhasma* (Black oxide of silver). Silver leaves are treated with twice their weight of Cinnabar and heated in the subliming apparatus. The mercury rises up and collects in the upper vessel and silver in powder form remains in the lower vessel. Prepared silver is thus *sulphide* of silver and not oxide of silver. It contains 84 p.c. of silver and 16 p.c. of sulphur. Dose.—of the leaf,—1 to 2 grains; of the powder,—½ grain.

Action.—Silver leaf and *Bhasma* (powder) are tonic, stimulant and aphrodisiac. Silver is said to be "acidulous, sweet, astringent, cool, demulcent, purgative, emetic, constipative, alleviative of wind and bile"—(N. N. Sen Gupta). According to Rasaratna Samucchaya it is "acid-sour in taste, sweet in action, cooling, purger, destroying of *Vayu* and *Kapha,* appetiser, enervator of digestive heat, rejuvenator and nourisher of memory and intelligence."

Uses.—The silver leaf and powder are given in combination with stimulant confections and with various aphrodisiac medicines. They are highly recommended in excessive heat in the body, hectic fever, phthisis, chest affections, impotence and seminal weakness; also in painful and irritable condition of the stomach and intestines, in heart-burn and in chronic

diarrhoea, in uterine diseases as leucorrhoea, menorrhagia etc., and in irritability of the uterus. Silver enters into the composition of several remedies as *Yogaraja* (See under Asphaltum), *Jayamangala Rasa, Vrihat vata gajankusa* etc. In hysteria, hypochondriasis and other nervous affections, a *confection* made of *gaozuban*, amber, silver leaves and sugar equal parts is useful. As an alterative tonic and aphrodisiac in general debility, impotence etc., a pill known as *Mahalakshmibilas Rasa*, is used; it is made up of the oxides of silver and orpiment (prepared) 1, prepared Talc 8, prepared mercury and sulphur each 4, prepared tin 2, prepared copper ½, camphor, nutmeg and mace each 4 and seeds of Argyreia speciosa and of *dhatura* each 2 parts, all mixed together, rubbed with the juice of betel leaves and made into pills of about 6 grains each. In dyspnoea of phthisis a preparation known as *Kanchanabhra* is recommended; it is composed of gold and silver, red sulphide of mercury, burnt coral and pearl, iron and mica, musk, realgar, and embelic myrobalan. In asthma and other complaints of difficult breathing a preparation named *Swasa Gajankusa* made of gold and silver, mica, tin, camphor, red sandal wood, close, *malati* flower (Echites caryophyllata?) with juice of Adhatoda vasaka, is recommended. In cases of obesity, a preparation made of silver leaf 4, long pepper 6, black pepper 2, Cyperus rotundus 2, rock salt 2, and borax 4 parts; the whole triturated in cow's urine is useful. Dose is grains 2 to 10 or even 20. It also increases appetite etc.—(Khory). *Externally* the powder has been used and on sore nipples, foul ulcers etc. Silver leaf applied to ulcers forms a soluble albuminate with the serum excreted. Other actions and uses of silver are similar to those of gold, but somewhat inferior.

---

## 10. ARSENUM; ACIDUM ARSENIOSUM

*Sans.*—Sankhavisha, Darumucha; Sambalakshara. *Eng.*—Arsenious Acid; White oxide of arsenic; White arsenic; flowers of arsenic. *Arab.*—Sammula far. *Pers.*—Margemosha. *Hind.*—Sankhya. *Duk.*—Safed sambala. *Ben.*—Sumbulkhar. *Guj.*—

Somal khar. *Mah.*—Sankhya sambala. *Tam.*—Vella pashanum. *Tel.*—Tela pashanum. *Can. & Kon.*—Sankhya pashana, *Burm.*—Tein; Hypso. *Sinh.*—Sudu pasanum. *Mal.*—Waranganpulih.

Source.—Found in arsenical ores as arsenates of iron, nickel or cobalt; commercial arsenious acid is obtained by roasting the native ores, in the form of a sublimate. The metal arsenic is widely distributed in nature, but in small quantities. With oxygen it forms arsenious acid.

Characters:—The by-product arsenious acid exists as a solid, heavy, white powder, or stratified masses or minute transparent and glass-like crystals, tasteless, soluble in water (1 in 100), in boiling water (1 in 10), in glycerine (1 in 5), very slightly in alcohol, in alkalies and their carbonates and in hydrochloric acid.

Action.—In very small doses, it is stomachic, general and nervine tonic, alterative and antiperiodic; and a cardiac, respiratory, intestinal and sexual stimulant. Externally, irritant. "Arsenic alters our constitution in such a manner that our vital resistance becomes capable of combating many diseases" —(H. C. Sen).

Purification.—White arsenic is purified by being soaked in lemon-juice or the juice of the plantain tree. Dr. H. C. Sen's method consists in boiling the powdered arsenic tied in a cloth for about 3 hours in milk on a slow fire and subliming it in a closed vessel. This boiling in milk mitigates its action; sublimation increases its penetrating power.

Uses.—It is used in a variety of diseases; but chiefly in fever, either alone or combined with other substances. Some physicians administer ghee containing arsenic (sublimed or atomised after being boiled in milk on a slow fire for a long time, so that the sublimate may be absorbed in the cream) in gradually increasing doses from a minim to two with milk. This preparation has better effect than that of the B. P. To increase immunity from diseases arsenic is administered in gradually increasing doses, generally in the beginning of winter or in the rainy season. To prevent the cumulative

action of the drug and also to soothe its irritative effect a mild purgative, generally the infusion of the three myrobalans in purgative doses is taken during the course of arsenic. During the course plenty of fatty food like milk, ghee, butter etc., should be taken. In chronic liver complaints, in lienteric diarrhoea, arsenic in minute doses is very useful. In very bad cases of diarrhoea with anasarca, minute doses of arsenic with opium are administered with great benefit; but salt and water are stopped altogether until the patient is fairly convalescent—(H. C. Sen). A preparation known as *Jvara-brahmastra* prepared in cow's urine and in the juice of Celsia coromandeliana *(Kokasima)* and prescribed in "*Tantroctah*" (book) for recent and chronic fevers, ague and remittent fevers is administered in minute quantities (the weight of a mustard—about one-ninth of a grain) with a lump of sugar in intermittent fever before the paroxysm comes on. Another preparation called *Darubrahma rasa* is recommended in "*Sankshipatasarah*" (book); it consists of white arsenic, cinnabar, datura seeds and long pepper, equal parts, made into four-grain pills with lemon juice; they are given with the juice of Ocimum sanctum in remittent fever with shivering, incoherent speech or wandering, profuse perspiration or much heat of body and difficult breathing. *Chandesvararasa* is yet another preparation recommended by the same authority and consisting of equal parts of mercury, sulphur, aconite, prepared copper and white arsenic, prepared in the juice of fresh ginger and in the juice of Vitex negundo, and made into pills, about a grain each and administered with the juice of fresh ginger. Along with this medicine, inunction with oil, cold bathing and nourishing food should be used. In Malaria, Dr. R. L. Puranik of Nanded (Deccan) has been using concentrated infusion of chiretta with Liquor Arsenicalis in minim doses and the preparations of *Gulancha* with great success, even where quinine and neo-salvarsan have failed. Pills made of Arsenic, sulphide of mercury, chebulic myrobalans and Trikatu are used in malaria, anaemia, diabetes, psoriasis etc., in doses of 1 to 4 pills of 1 grain each, three times a day after meals. These were tried in 59 cases of malaria, in the out-patient's Department of the General Hospital, Madras, and "found to be

useful in checking the attacks of malarial fever"—(Ind. Drugs Rept. Madras). Dr. H. C. Sen says that "the use of arsenic (prepared in the Ayurvedic method) with the three myrobalans (*triphala*) or simply chebulic myrobalans or any other mild purgative to prevent its cumulative action is sufficient to save the villagers from dyspepsia or malaria. Arsenic when taken in large doses and continued for a long time often leads to emaciation and gastric and intestinal catarrh. As a rule it should be taken after meals. Enlarged lymphatic glands often yield under its treatment. By its use obesity is cured. It is useful in chorea occurring in delicate children, in neuralgia of the 5th nerve, intercostal neuralgia and that of miasmatic origin. In neuralgias it should be combined with quinine and given in large doses. In pulmonary phthisis, in chronic coryza, bronchitis acute and chronic, and in gastro-intestinal disturbance associated with diarrhoea, arsenic is highly useful. A preparation known as *Brihat Kasturi Bhairab* consisting of arsenic, gold and silver, musk and camphor, copper and mica, the dried seed of Mucuna pruriens and Pavonia odorata, Embelia ribes, Cyperus rotundus and ginger, is recommended in dyspnoea with fever, collapse, delirium etc. It is very effective in sloughing of the mouth, sore throat and cancrum oris. In leucorrhoea and diabetes it has been found useful. In chronic diarrhoea in children minute doses of arsenic judiciously used have given good results.

*Externally* it is used to remove large growths as cancer and lupus; also used locally to kill vermins in the head and other hairy parts. *Cigarettes* made of tissue paper impregnated with the solution of arsenic are used with benefit in asthma. As a caustic, arsenic is applied to piles. A *butter* or *oil of arsenic* prepared by churning a mixture of it and a *paste* made of the roots of Calotropis gigentea and Nerium odorum is used as a nervine tonic and aphrodisiac. It is useful in asthma, cough and seminal weakness; it is administered in betel-leaves, by giving them a coating of the oil by means of a stick or probe. Dose of the oil is one-sixtieth of a grain. A *ghee* is prepared by taking ½ dr. each of white arsenic and opium, and four ounces of Nerium odorum, finely powdering and mixing them with 8 pounds of ghee and heating the whole

over a fire for 4 hours and filtering and keeping for use when required. Also an oil is prepared by powdering seeds of Abrus precatorius and croton seeds, aconite and white arsenic, all in equal parts, and mixing them with goat's milk and expressing oil out of the mass. This oil is kept for use when required. These are useful as external medications in impotence etc. A few simple useful remedies:—(1) Take of *Somala bhasma*, (prepared by taking purified arsenic and submitting it to a process of roasting) 1 gr. Borax 100 grs. Make a paste in the leaf juice of Azadirachta indica. Dose is 10 to 20 grams; used in quartan fever. (2) Take of *Somala bhasma*, and Sulphide of Mercury, each 1, Anacyclus pyrethrum 5, and Pistacia khinjuk 4 parts. Make a pill mass with honey. Dose is 3 to 5 grains. Used in secondary or tertiary syphilis. (3) Take of *Somalabhasma* 1, Solanum jacquinii 20, lime juice 20 parts. Make a pill mass. Dose is 1 grain; used in syphilitic rheumatism, cough and asthma. (4) Take of *Somalabhasma* 1, Carbonate of Soda 1, impure carbonate of potash 1, Piper longum, and Piper nigrum, each 5 parts. Dose is gr. ½; used in asthma. (5) Take of white arsenic 1 grain and white sugar 1000 grains. Mix and powder them *finely* in a mortar; dose is 2 to 4 grains as alterative and anti-emetic—(Hakeem Ahmed ud deen Saheb, Lahore).

*During administration of arsenic, chillies, oil, asafoetida and other hot and spicy things should be avoided.* Milk, sugar, ghee, butter, grams and other nutritious substances should be taken in large quantities.

---

## 11. ARSENII DISULPHIDUM; Bisulphuret of Arsenic; Arsenicum Rubrum

(*Sans.*—Manashila. *Eng.*—Realgar or Red orpiment; Arsenic disulphide. *Port.*—Rosalgar. *Fr.*—Sulphure rouged arsenic. *Ger.*—Arsen-sulphur. *Arab.*—Zurneik surkh. *Pers.*—Yaranikhee surkha. *Hind.*—Lal Haratal; Lal Sambal. *Ben.*—Manaswila. *Guj. Mah. Kon. & Can.*—Manasil. *Tam.*—Kudire-palpashanam. *Mal.*—Warangan) is artificially prepared by fusing arsenious acid 5

parts with sulphur 3 parts. It is purified by being rubbed with the juice of lemons or of ginger. It is used as an alterative, febrifuge and tonic, given in fever, cough, asthma and skin diseases; in these last it is used also externally. Locally it is applied to fistulous sores. In fever it is generally used in combination with mercury, orpiment etc., as in the following:—*Chandesvara rasa* already mentioned under "Arsenious Acid" is recommended in Rasendrasarasangraha for remittent fevers. *Svasakuthara Rasa* is another preparation mentioned in the same, and consisting of realgar, mercury, sulphur, aconite, borax, black pepper, ginger and long pepper, is recommended in asthma with cough and in remittent fever with cerebral complications. Dose is 4 grains in pill form. In coma from remittent fever, these pills are powdered and used as a *snuff* to rouse the patient; also used similarly in cephalalgia, hemicrania, ozoena etc. Realgar mixed with the ashes of Achyranthes aspera is applied to patches of leucoderma or white lepra. In leprous ulcers a *liniment* composed of realgar and orpiment 2 parts each, black pepper 4 parts, sesamum oil 20 parts and the juice of Calotropis gigentia 5 parts is recommended as application in Chakradatta. The same recommends for application to the eye, in affections of the internal tunics, tumours or other growths, night blindness etc., a preparation known as *Chandraprabha Varti* which is made of realgar, galena, conch-shell lime, seeds of Moringa pterygosperma, long pepper, liquorice and the kernel of belleric myrobalan in equal parts rubbed together with goat's milk, dried and made into small *pastils*. These are rubbed with a little honey and applied to the eyes as a collyrium. Bhavaprakash recommends an *oil* for application to fistulous sores; it is prepared as follows:—Take of sulphur, realgar and turmeric 8 tolas each, mustard oil 1 seer, juice of datura leaves 1 seer & water 4 seers. Boil together in the usual way.

---

## 12. ARSENII TRISULPHIDUM ($As_2 S_3$) or Trisulphuret of Arsenic

(*Sans. Mah. & Ben.*—Haritala. *Eng.*—Orpiment; Yellow sulphuret of arsenic, Yellow Arsenic trisulphide. *Hind.*

& *Duk.*—Haratala. *Arab.*—Ursanigum. *Pers.*—Zarneik-zard. *Guj.*—Aratal. *Tam.*—Arridaram; Yellikud pashanam. *Tel.* —Daddipashanum. *Can. & Kon.*—Ardala. *Burm.*—Hsaydan-Shwaywa. *Sinh.*—Aridala) is found native in China and Persia. Orpiment occurs in two forms *viz.*, in smooth shining, gold-colored scales called *Vansapatri haritala* and in fine lemon yellow opaque masses called *Pinda haritala.* The former is preferred for internal use as an alterative and febrifuge.

Action:—Emmenagogue. Haritala is purified for internal administration, by being successively boiled in *Kanjika,* the juice of the fruit of Benincasa cerifera, sessamum oil and a decoction of the three myrobalans for three hours in each fluid; or it may be boiled in the mixture of all these fluids together to save time, as done by some physicians. The dose of the purified orpiment is 2 to 4 grains. It is generally known as *harital bhasma.* As an antiperiodic and alterative tonic it is given to cure fevers and skin diseases, to increase strength and beauty and to prolong life; also in incipient phthisis and asthma, paraplegia, hemiplegia, monoplegia and facial paralysis, in cough, chronic fever, gonorrhoea, epilepsy, dropsy etc. It is generally used in combination with other ingredients. Pills known as *Ramban Rasa* composed of orpiment, sulphur and asafoetida are recommended in asthma and chronic skin diseases as eczema, psoriasis etc., in doses of 1 to 4 pills of one grain each with ghee three times a day after meals. "This preparation was administered to cases of asthma and rheumatism and was fairly beneficial in giving relief to the patients in those diseases"—(Ind. Drugs Rept., Madras). A preparation called *Mahalakshmibilas* composed of mercury and sulphur, arsenic, iron, mica, tin, copper, aconite, camphor, nutmeg, mace and seed of Gmelina asiatica is recommended in *Vayu & Kapha* (asthma). It is given rubbed with betel leaf juice. In fevers it is used in combination with mercury, aconite etc.; for example, the *Vetala rasa* recommended in Bhaisajyaratnavali, is made of equal parts of purified mercury, sulphur, orpiment, aconite and black pepper; these pills of two grains each are given with the juice of fresh ginger in remittent fever with affection of the brain. In enlargement

of spleen and other abdominal viscera. *Vidyadhara rasa* described in Rasendrasarasangraha is recommended; it is made up of mercury, sulphur, prepared copper, iron-pyrites, realgar and orpiment in equal parts, rubbed together and then soaked in a decoction of long pepper and in the milky juice of Euphorbia nerifolia, and made into pills of 6 grains each. These are given with honey. In chronic irregular fever with intestinal worms and blood parasites, a preparation called *Kitari Rasa* consisting of realgar, mercury and sulphur, *indrajav, bonjowan* and *palash* and juice of Luffa amara is given with the juice of Phaseolus roxburghii and sugar as vehicle. For all sorts of chronic skin diseases Bhavaprakasha prescribes a compound called *Talakesari rasa* which is composed of orpiment, realgar, iron pyrites, mercury, borax and rock salt one part each, sulphur and burnt conch shell two parts each, rubbed together for a day with lemon juice, then with aconite 1/30th part of the weight of the whole mass; dose is 5 to 10 grains with butter; this should be followed by two drachms of the powdered seeds of Vernonia anthelmintica mixed with honey and ghee. A similar prescription is given in Sarangadhara under the name of *Mahatalesvara.* A cure for leprosy has been advocated by Pandit J. L. Duveji and it is this:—"One *ratti* or half of *harital bhasma* to be taken daily with betel. Oil of Copaiba should also be rubbed over the affected parts. This is a successful remedy. The patient should take sweetmeats". As an *external* application for skin diseases, especially in psoriasis Sarangadhara prescribes a *paste* made of orpiment, wood of Berberis aristata, seeds of Raphanus sativus, wood of Pinus deodara and betel leaves each two tolas and burnt conch-shell half a tola, beaten together with water into a thin paste. Also as a *depilatory,* orpiment forms an ingredient of several formulae for the removal of hair; *e.g.,* a paste made up of conch-shell-lime (soaked in the juice of plantain tree) and of orpiment in equal parts; or of conch-shell-lime two parts, orpiment and impure carbonate of soda one part each and realgar half a part rubbed together with water, both of these are recommended in Sarangadhara. For leprous ulcers a *liniment* made of orpiment and realgar 2 parts each, black pepper 4 parts, sessamum oil 20 parts and the milky juice of Calotropis

gigentia 5 parts, is useful. For warts and corns the *liquor* of purified orpiment is applied locally. In cases of ringworm an *ointment* made of harital 1 part and sweet oil 2 parts is useful for external application. For suppurating scrofulous glands an *oil* made of yellow and red orpiment, marking nut, cardamoms, Indian aloes, sandalwood, Valeriana hardwickii and Jasmine each 1 part, Neem oil 40 parts and water 100 parts, boiled together and prepared in the usual way, is a highly useful application.

---

## 13. ASPHALTUM

*Sans.*—Silajit; Silaras. *Eng.*—Asphalt; Mineral pitch; Jew's pitch. *Hind. Guj. Mah. & Can.*—Silajita. *Ben.*—Silajatu. *Arab.*—Hajar-ul-musa. *Pers.*—Momiai Faqurul Yahud. *Hind.*—Ral-yahudi. *Tam.*—Perangyum; Uerangyum.

Source.—Ejected out of rocks during hot weather in the lower Himalayas, Vindhya and other mountain tracts and Nepal where iron abounds, naturally flowing out from between the fissures in the rocks; or it may be a tar formed in the earth from the decomposition of vegetable substances. "Large quantities are imported into India from Khatmandu (Nepal). A white variety is said to be collected from rocks in Mount Abu (Rajputana)."—(Chopra).

Remarks.—"Alum earth of Nepal which is sold in Calcutta as *white shilajit* is quite a different substance from the Silajit used in the Hindu Materia Medica. A product called '*Momia*' resembling Silajit, is obtained from some of the mountains in Arabia and Persia".—(Chopra).

Varieties and their Characters.—"Four varieties of silajit are described by the ancient Hindu writers:—(1) the *gold silajit* which is red; (2) the *silver silajit* which is white; (3) the *copper silajit* which is blue coloured; and (4) *iron silajit* which is blackish brown. Blue and red siljit are not found commonly and the variety most available is the fourth variety which, from the therapeutic point of view, is considered to be active".—(Chopra's "I.D. of I." p. 433).

"Silajit is a bituminous substance, which is a compact mass of vegetable organic matter composed of dark-red gummy (sticky and unctuous) matrix interspersed with vegetable fibres, sand and earthy matter".—(Chopra). Silajit is of a bitter taste and of a smell resembling cow's stale urine. This is known as *gomuthra silajit.* The other variety found in the bazaars is called *Karpoora Silajit* which occurs in white plates. On igniting, it leaves a large quantity of ash consisting of lime, magnesia, silica and oxides of iron. The black variety is the one mostly used in medicine, after purifying it by certain processes. "Purified 'Silajit' *(Shodhita)* is just like the concentrated watery extract of the crude stuff. Both the crude and purified samples have a decided urinous odour and slightly bitter, saline, somewhat pungent and astringent taste. The purified substance is nearly completely soluble in water and has an acid reaction".—(Chopra).

Constituents.—"The gummy substance of silajit dissolves in water and when washed away leaves an earthy matter, vegetable fibres and a few black round button-like masses (1/8th inch in diam.) resembling peas. The insoluble matter is removed by straining through a thick cloth or flannel. The fluid is allowed to stand in the sun when a creamy substance rises to the top".—(Chopra).

"Silajit contains an oil which when distilled is known as ichthyol. Benzoic acid and benzoates which are present in silajit in large quantities are considered by Chopra to be the main active principles. Ray (1930) is of opinion that there must be some other active principle or some unknown body or a pyridin derivative, in silajit."—(Chopra).

It contains 65 p.c. of urea. Analysed by Hooper it yielded:—water 8.85 p.c., organic matter 56.20 p.c., and mineral matter 34.95 p.c. containing nitrogen 1.03, lime 7.80, potash 9.07, phosphoric acid 0.16 and Silica 1.85 p.c. It dissolves in water and is neutral in reaction. "The organic matter yielded to spirit a small percentage of brownish coloured wax-like substance which melted on heating and burnt away with a smoky flame. It retained the peculiar odour of the drug and had no marked taste. It was neutral in reaction and did not

assume a crystalline structure when carefully evaporated from alcoholic solution. The tests would indicate the presence of a mineral hydrocarbon of a bituminous nature. The bulk of the dark brown organic matter had the properties of humic acid. The drug, from a chemical point of view, should have some valuable manurial properties".—(Chopra's "I.D. of I." p. 434).

The results of samples analysed by Chopra and his co-workers are as follows:—

*White Silajit:*—A sample of white silajit, which is considered to be more effective than the black variety, was also examined by Chopra. It was a cream-coloured crystalline with a strong nauseous odour. It was apparently of animal origin and afforded gaseous ammonia when mixed with slaked lime. It yielded 64 per cent of pure urea when determined from the amount of nitrogen given off by means of hypobromite of sodium. It appeared to be crude urea or evaporated urine in a solid state.

A careful analysis of the ordinary silajit was carried out by the author and his co-workers. It does not contain any compound of the nature of an alkaloid. The following table shows the percentage of dried extracts after distilling off the solvent.

| Solvent | Crude silajit amount dissolved in per cent. | Purified silajit amount dissolved in per cent. |
|---|---|---|
| Chloroform .. | 2.15 per cent. | 5.88 per cent. (cryst.) |
| Ethyl acetate .. | 1.12 „ „ | 1.37 „ „ |
| Alcchol (80 per cent.) .. | 29.25 „ „ | 30.81 „ „ (cryst.) |
| Water .. | 22.66 „ „ | 28.32 „ „ |

Both the alcoholic extracts crystallised after several days and were found to contain benzoic acid; the ash left after ignition showed the presence of a larger quantity of lime. The crystals under the microscope looked like those of calcium benzoate. The ethyl acetate extract was crystalline in nature. It contained a substance soluble in alcohol and partially soluble in hot water, but practically insoluble in ether and chloroform. The crystals had a melting point of 187°C

and were identified by further examination to be those of hippuric acid.

The result of the analysis shows that *silajit* is composed of the following substances:

*Organic Constituents*

| | Crude silajit per cent. | Purified silajit per cent. |
|---|---|---|
| Moisture .. .. | 12.54 | 29.03 |
| Benzcic acid .. .. | 6.82 | 8.58 |
| Hippuric acid .. .. | 5.53 | 6.13 |
| Fatty acids .. .. | 2.01 | 1.36 |
| Resin and waxy matter .. | 3.28 | 2.44 |
| Gums .. .. .. | 15.59 | 17.32 |
| Albuminoids .. .. | 19.61 | 16.12 |
| Vegetable matter, sand, etc. .. | 28.52 | 2.15 |

Moisture was determined by drying the substance in the steam oven at a temperature not exceeding 90°C. Albuminoids were calculated from the total nitrogen, determined by Kjeldhal's process (modified) after deducting the percentage of nitrogen in the hippuric acid present.

The mineral constituents, as obtained from the ash by incineration of the substance at a dull red heat, are also appended in the following table:—

| | Crude silajit per cent. | Pure silajit per cent. |
|---|---|---|
| Moisture .. .. | 12.54 | 29.03 |
| Loss on ignition .. .. | 64.58 | 52.63 |
| Ash .. .. .. | 22.88 | 18.34 |
| Silica (residue insoluble in HCl) | 4.60 | 2.69 |
| Iron ($Fe_2O_3$) .. .. | 0.51 | 0.64 |
| Alumina ($Al_2O_3$) .. .. | 2.26 | 2.61 |
| Lime (CaO) .. .. | 6.83 | 4.82 |
| Magnesia (MgO) .. .. | 1.29 | 1.20 |
| Potash ($K_2O$) .. .. | 4.60 | 3.81 |
| Sulphuric acid ($SO_3$) .. | 0.64 | 0.97 |
| Chloride (NaCl) .. .. | 0.26 | 0.57 |
| Phosphoric acid ($P_2O_5$) .. | 0.28 | 0.24 |
| Nitrogen .. .. | 3.64 | 3.36 |

From a comparison of the above results, it appears that there is not much difference between the crude and the purified silajit. The crude stuff leaves a residue after extraction

with water which amounts to about 30 per cent, whereas the residue in the purified drug is only about 2/3 per cent. This may lead one to suppose that the purified silajit contains more extractives than the crude form. This would have been the case were it not for the fact that the high percentage of moisture in the purified substance counter-balanced the insoluble matter in the crude stuff. The main point of difference between the varieties is that the chloroform and ethyl acetate extracts of the purified substance deposit crystals of benzoic and hippuric acids, but there are none in similar extracts made from the crude silajit. It would appear, therefore, that a portion of the benzoic and hippuric acids remains free in the purified silajit. Probably the salts of the benzoic and hippuric acids in the crude silajit are hydrolysed during the process of purification.

From the physical characteristics and from a microscopical examination of the residue left after extraction with water, which was mainly composed of sand, earthy matter and vegetable fibres, silajit would appear to be a substance of vegetable origin. Its chemical composition, however, shows the presence of hippuric acid and a high percentage of albuminoids, which makes this supposition doubtful. If hippuric acid is formed from the decomposition and decay of vegetable protein substances without animal intervention, the amount of proteins must be in unusually higher proportions than is ordinarily met with in the vegetable kingdom. It is well-known that benzoic acid can be easily formed from hippuric acid, in fact this is one of the commercial methods of its manufacture. It is further found that benzoic acid manufactured from hippuric acid possesses a decided urinous odour and we have already mentioned that the crude and the purified silajit possess this odour. The presence of gum and resin is also a point in favour of its vegetable origin. The other possibility is that silajit may be composed of the excrements of some animals which have been washed off by the rains from the hill-side and have been deposited in the crevices and low-lying rocks. During the summer the heat of the sun removes the moisture and leaves the residue like an exudation on the rock.

The whole of the subject of the production of silajit requires further investigation. (Chopra "I.D. of I." pp. 434 to 436).

Action.—Locally antiseptic, anodyne, parasiticide and antiphlogistic. Internally alterative, tonic, slightly laxative, cholagogue, respiratory stimulant, disinfectant and expectorant, intestinal antiseptic, diuretic and lithontriptic.

Uses.—Charaka says "There is hardly any curable disease which cannot be controlled or cured with the aid of *Silajit*". It is used by Kavirajas and Hakims in a great variety of diseases. It is specially employed in genito-urinary diseases and in diabetes; in gall stones, jaundice, enlarged spleen, fermentative dyspepsia, worms, digestive troubles, piles, adiposity, anasarca, renal stone, renal and bladder calculi, anuria etc., hysteria, neurasthenia, epilepsy and insanity, nervous diseases; amenorrhoea, dysmenorrhoea and menorrhagia; scrofula, tuberculosis, phthisis and leprosy; eczema, elephantiasis, anaemia, anorexia, biliary congestion, chronic bronchitis, asthma, fracture of bones etc., in diabetes in which it reduces the quantity of sugar and urine. *But it increases the quantity of urea; therefore, it should never be given in uric acid calculus.* It diminishes phosphaturia and is useful in phosphatic concretions. It is also useful in ascites, uraemia, cholaemia and the like. It is valuable in cases of diabetic albuminuria, where both casts and albumin diminish; it is said to be a cure for diabetic amaurosis. "Under the influence of *silajit*, thirst, polyuria, burning sensation and exhaustion disappear quickly. It markedly helps the assimilation of sugar. Kavirajas use silajit in combination with milk or grape juice". —(Chopra). An extract is made from crude *Silajit* by making an emulsion of it with hot water and repeatedly exposing the emulsion to the sun. A cream floats on the surface and it is removed and collected. The process is continued as long as any cream rises. The extract of *silajit* thus collected is sun-dried and then purified by being soaked in a decoction of *triphala* and *dashamula*. "Purified silajit is also recommended to be soaked in the decoctions of one or more of the following plants as this is said to increase its efficacy:—Shorea robusta; Buchanania latifolia; Terminalia tomentosa; Acacia farnesiana;

Catchu nigrum; Terminalia chebula; and Sida cordifolia".—(Chopra). It is a powerful tonic and alterative useful in a variety of diseases. "Dose of this purified product is 5 grains taken as pills—one pill to be taken 10 minutes after food, followed by an ounce or two of milk".—(Andhra Medical Journal). *But it is generally begun with 1 grain or so, and gradually increased.* Dr. Koman says that he had used this medicine with *Abhrak bhasma* in two cases of diabetes (22 grains of sugar to the ounce and 36 grains to the ounce) and the sugar disappeared completely after about 3 weeks' treatment, the accompanying symptoms such as excessive flow of urine, thirst, neuritis of legs etc., having also subsided to a considerable extent. Both the patients were on milk and bread diet. He also adds that a few years ago he "saw a case of chronic cystitis deriving much benefit from the use of *Silajit,* which was administered by an Unani physician".—(Ind. Drugs Report, Madras). *Silajit* is used as a *paste* and *bhasma;* to prepare paste, macerate *silajit* in the juice of Margosa leaves, *gulancha* and ghee; and to prepare *bhasma,* take *Silajit* and sulphur 20 parts each and orpiment 10 parts, mix together, triturate in the juice of *bijorun* and roast. Dose is 1 to 2 grains. *Bhasma* is given in retention of urine, scalding due to gravel, gonorrhoea, leucorrhoea, also in cough, diabetes, consumption, etc. As a tonic it is given in anaemia and general debility; as abortifacient it causes uterine contractions and promotes expulsion of the foetus. As an anthelmintic, its *suppositories* are used to remove ascarides from the rectum. "It is also used as an antiseptic in parasitic diseases of the skin and as an antiphlogistic. Unani physicians used it as an antidote to poisons and in the treatment of other diseases. Hakims use '*Momia*' as an external application for inflammatory swellings, arthritis, etc."—(Chopra). *Paste* is locally applied to relieve rheumatic pains in joints, used as an embrocation in paralysis, contusions etc.; also in sprains and bruises. "When applied externally, *silajit* has been credited with antiseptic, parasiticidal, anodyne and antiphlogistic properties by Kavirajas; these are in all probability due to the free benzoic acid which it contains. It is well-known that benzoic acid which in concentrations of over 0.1

per cent, produces moderate local irritation, may in this way be useful as an application to sprained and bruised parts. Benzoic acid is also responsible for the beneficial action of silajit on the appetite and its use in dyspepsia. Its good effects in affections of the liver such as jaundice, its mild narcotic action, its antispasmodic effects in colics of all forms and spasms of muscular tubes and asthma may also be attributed to the presence of this acid and its salts. Silajit is used by the Hindu physicians in acute and chronic bronchitis and benzoic acid and benzoates are administered in these conditions in the Western medicine, especially for children and to old feeble persons with profuse thin secretion. It undoubtedly promotes expectoration, probably reflexly, by causing irritation of the throat and stomach. The Vaidyas prescribe *silajit* in arthritis and pulmonary tuberculosis; 30 years ago, benzoic acid and its salts enjoyed a reputation in the Western medicine as a remedy for these conditions, but are given up. The indigenous practitioners also used *silajit* as a diuretic and lithontriptic. Similar properties were attributed to benzoic acid in Western medicine. It will be seen, therefore, that most of the properties ascribed to *silajit* can be explained by the presence of benzoic acid and benzoates which are present in it in large quantities and which Chopra considers are the main active principles of silajit." (Chopra's "I.D. of I." pp. 437-438). Internally *silajit* is very useful in chronic dyspepsia, and dyspeptic diarrhoea, given with the decoction of emeblic myrobalans; in biliary colic and jaundice with the decoction of the three myrobalans (*triphala*) or of *dasamula*. In dyspepsia due to hepatic derangement, *silajit* is used in combination with other cholagogues. In the first stage of ascites it is used with iron-rust together with milk diet; *salt and water is stopped altogether.* Rice and milk boiled together into gruel is a good dietary in commencing cirrhosis of the liver of adults. In the first stage of infantile cirrhosis *silajit* is used with other cholagogues like the juice of the leaves of Andrographis paniculata, of Cajanus indicus or of Nyctanthes arbor-tristic. In false angina pectoris even during the absence of paroxysms it is recommended. It is very useful in acute and chronic bronchitis and in bronchiectasis; in asthma

with bad liver and indigestion, in the asthma of gouty people, in pulmonary phthisis, in diabetic phthisis and in intestinal tuberculosis. In sexual weakness it is generally administered with *Asvagandha,* in spermatorrhoea with grape juice or infusion of the three myrobalans *(triphala)*; in chronic gonorrhoea and gleet, with prepared oxides of tin, lead, silver etc. It can also be used alone with much benefit. In functional menorrhagia complicated with biliousness and hepatic derangement it is commonly given with the decoction of emblic myrobalahs, or combined with astringent drugs like catechu, flowers of Woodfordia floribunda or syrup of the corm of red lily. In leucorrhoea from debility it is given with milk or with astringents. In strangury or painful micturition *Silajit* is used with other diuretics and demulcents like the decoction of Tribulus terrestris, Glycyrrhiza glabra etc. In albuminuria and chyluria it is beneficial with the decoction of astringents like catechu, Shorea robusta, juice of leaves of Cajanus indicus, or of garlic. In hysteria it is generally used with infusion of Valeriana jatamansi or decoction of Alhagi Mourorum and in insanity with the infusion of the three myrobalans (*triphala*) or decoction of *dasamula*.—(H. C. Sen). As an alterative tonic it is used in combination with iron as in the following confection called *Yogaraja* mentioned in Chakradatta. It is made of *Silajitu,* prepared iron, iron pyrites and silver each 5 parts, *the three myrobalans,* ginger, black pepper and long pepper, plumbago root and baberang seeds each 1 part, and sugar 8 parts, all powdered, mixed and made into a confection with honey. Dose is about half a tola; used in anaemia, jaundice, consumption, chronic fever, skin diseases, urinary diseases, piles etc. A pill made of *Silajit* 2 parts, Tribulus terrestris 5 parts and honey 2 parts is used in urinary diseases, scanty urine, cystitis etc. Dose is 10 to 15 grains. A powder called *Pachanabheda Churna* made of equal parts of *Silajit,* Carbonate of iron and lime, long pepper, Trichosanthes cucumerina, is used in gonorrhoea, leucorrhoea and other mucous discharges. Dose is 10 to 15 grains, Dr. H. C. Sen concludes that *Silajit* should be tried extensively in obesity, diabetes, dyspepsia, anasarca, enlargement of liver and spleen, painful and bleeding piles, asthma, strangury, renal

diseases and functional uterine troubles; that continued use of this remedy appears to remove the tendency to formation of renal and biliary calculi; that it is far better and safer than morphia injection in biliary colic. Because morphia relieves temporarily, but *silajit* cures permanently, and morphia does harm to the liver in the long run by stopping the secretion, whereas *Silajit* is a valuable cholagogue and laxative. "Chopra's trial of purified silajit by itself (in pill form) till a maximum of 30 grains a day during 24 hours, in a series of cases of diabetes mellitus, and doses ranging from 5 grains to 10 grains, three times a day, for a period of 8 to 12 days, in a series of diabetic patients, had no effect whatever either on the blood sugar or sugar in the urine. There was no decrease in the total quantity of the urine passed, and there was no amelioration of such symptoms as thirst, exhaustion etc. The assimilation of carbohydrates was not improved in any way! Ray (1930) has shown that injections of extracts of silajit produce a rise in blood pressure and stimulation of respiration in experimental animals".—(Chopra's "I.D. of I." pp. 437-438).

---

## 14. AURUM

*Sans.*—Suvarna. *Eng.*—Gold. *Fr. & Ger.*—Geld. *Arab.* —Zahab. *Pers.*—Zara Tita. *Hind. & Mah.*—Sona. *Guj.*— Sonum. *Ben.*—Sonar. *Tam.*—Ponnu. *Tel.*—Bangaroo. *Mal.* —Tangam. *Can.*—Hondu; Chinna. *Kon.*—Bhangara. *Sinh.*— Ran-ta-hadu. *Burm.*—Shue-saku.

Source.—Found in primitive rocks, in aluvial deposits in small particles called gold dust. It is found commonly alloyed with other metals such as silver, copper, iron, etc.

Characters.—Pure gold has a metallic lustre, reddish yellow colour; it is the most ductile of all metals, softer than silver. It acquires lustre under pressure. It is not attacked by any acid except selenic acid and a mixture of which like nitro-hydrochloric acid, contains nascent chlorine.

Preparations.—Gold leaf and gold ashes. Dose: of the gold leaf 1/30 to 1/12 grain; of the powder 1/6 to 1/3 grain;

of the *bhasma* 1/10 to 1/4 grain. Gold leaf (*Sona varak*) is prepared by beating gold into extremely thin leaves. Gold powder or ashes (*Sona bhasma*) is prepared by rubbing together two parts of mercury and 1 part of leaf gold into a mass with lemon-juice, placing it in a crucible with three parts of sulphur. The crucible is then covered and exposed to heat. This process is repeated 14 times when the gold completely loses its metallic character, and becomes reduced to a dark brown impalpable powder. This process is advocated by Kaviraj Binod Lal Sen. But according to books gold should be rubbed with mercury only the first time and in roasting it afterwards sulphur alone should be placed in the crucible with the gold.—(U. C. Dutt).

Action.—Gold and its preparations are nervine and aphrodisiac tonic, resolvant, emmenagogue and alterative. They increase strength and beauty, improve intellect and memory, clear the voice and increase sexual powers; also stimulate the activity of the stomach, and of the skin and kidneys causing diaphoresis and diuresis. They also increase the flow of menses in women. In large doses, they act like irritant poison setting up gastro-enteritis with convulsions, cramps, insensibility etc. The *antidotes* are egg albumen, milk, flour etc.

Uses.—Preparations of properly reduced gold are used in fevers, consumption, insanity, diseases of the nervous system and urinary organs, hysteria, epilepsy, leprosy, asthma, nervous dyspepsia, amenorrhoea, impotence, sterility, habitual abortion, chronic Bright's disease, chronic metritis, syphilis and scrofula. Gold leaf is generally eaten with betel leaf; when given in the juice of Eclipta prostrata, it stimulates virile powers and acts as alterative; with the juice of *Ayapana* or juice of garlic or juice of Cactus grandiflorus it is given in tuberculosis; when given with *Punarnava* it improves the sight. In case of poisoning it is given with the juice of *Nirbishi (Ayapana*—the sensitive plant), in insanity, with the powder of dry ginger, round pepper and cloves; as a rejuvenator with butter or ghee or cream of milk; as an aphrodisiac with milk and sugar or candy powder; as a memory invigo-

rator, with sweet flag; for lustre of health, with saffron; for heart-disease with milk and bark of Terminalia arjuna and cane sugar. *Suvarna Vasanta Malti,* a preparation containing leaf-gold, pearl, red sulphide of mercury, zinc carbonate and black pepper is used in impotence, chronic fevers, gonorrhoea, syphilis etc.; dose is 2 to 5 grains in pill form mixed with honey. Rasendrasarasangraha recommends a pill known as *Jayamangala Rasa* which contains besides gold, sublimed mercury, cinnabar, prepared copper, tin, sulphur, borax, prepared iron and silver, iron pyrites etc. Dose is 4 grains. It is taken with cumin seed powder and honey; useful in old chronic fevers of all sorts; it is a powerful tonic and alterative, administered with suitable adjuncts in many diseases. In the same book is recommended a powder called *Mriganka Rasa,* which consists of mercury, prepared gold, sulphur, pearls and borax; it is administered in doses of one to four grains with about twenty grains of black pepper powder, in phthisis. Two other preparations named *Pottali Hemagarbha Rasa* and *Ratnagarbha pottali Rasa* which are used in this disease are made up of the same ingredients but in varying proportions. *Suvarna Parpati* is another preparation, which is composed of mercury, gold and sulphur and used like *Rasa parpati* in chronic diarrhoea and anasarca. Milk diet is enjoined and water and salt are prohibited. Dose is grains two gradually increased to ten in the course of 21 days, to be again gradually reduced to the original dose of two grains in another three weeks. Another preparation used in the same diseases is *Vijayaparpati* which contains diamond, pearls, silver, copper and talc in addition to gold, sulphur and mercury.

Prepared gold in doses of two grains daily with the addition of honey, ghee and emeblic myrobalan, or root of Acorus calamus is recommended to be taken for a lengthened period —(Sandehabhanjanee). It is also given to feeble infants in a few days after birth, as it imparts strength and beauty, in the following composition:—Take of powdered gold, root of Acorus calamus and Aplotaxis auriculata, Chebulic myrobalans and leaves of Herpestes monniera equal parts; powder and mix. Dose is two grains with honey and ghee. The

principal alterative tonic of the Ayurvedic physicians is a well known preparation called *Makaradhwaja.*

---

## 15. MAKARADHWAJA

### (See:—"Hydrargyrum" also)

Source.—"This is an inorganic preparation of the Hindu Pharmacopoeia from the time of Bhavamisra the renowned Hindu physician, of the 16th century."[1]

Characters.—"It is claimed by the Vaidyas that 'Makaradhwaja' is not ordinary red sulphide of mercury but is a combination of sulphide of mercury with gold. This gold is not in a chemically combined condition but its presence in a very fine state of division alters the property of the drug to a considerable extent."[2] "According to Ayurvedic Pharmacopoeia a great deal depends on the method for preparation adopted. Various methods have been described in books on Hindu medicine".—(Chopra).

Mode of Preparation.—"8 Parts of pure mercury and 1 part of gold leaf are mixed together to form an amalgam. To this mixture, 16 parts of sublimed sulphur are added and the resulting mixture is rubbed very thoroughly in a stone mortar for 24 hours or more until the whole is converted into a lustreless, fine, impalpable powder of uniform consistence. This powder should be light enough to float on water and there should be absolutely no lumps or grit in it when rubbed between the fingers. This is known as *'kajjali'* in Sanskrit and its chemical composition is said to be the same as black sulphide of mercury. This preparation forms the basis for the *'makaradhwaja'*. The *'kajjali'* is placed in a narrow-mouthed bottle and is gradually heated on a sand bath. When the temperature reaches a certain limit the bottle is filled with reddish fumes of various hues. On cooling, *'makaradhwaja'* is found deposited on the inner surface of the bottle. The sublimed powder is collected by breaking the neck of the bottle and scraping off the deposit, which is then preserved in a clean dry vessel for future use".—(Chopra).[3]

Composition.—Chemically '*makaradhwaja*' is identical with the red sulphide of mercury. This sulphide occurs in nature as the mineral ore called 'cinnabar' in many parts of the world, particularly in California, China and Spain.[4] For further particulars see "hydrargyrum".

Constituents.—"Although gold is used in the preparation of '*makaradhwaja*', properly speaking it is a preparation of mercury and sulphur, sublimed in the form of red sulphide as in the preparation of mercury called '*Rasasindura*'; the gold may possibly exercise some catalytic influence during the process of sublimation".—(Chopra).

Purification.—"A great deal of stress has been laid by the Hindu physicians on the purification of mercury employed for the preparation of this drug. The mercury used has to be passed through various methods of purification laid down in the Ayurvedic books, before it can be accepted for use. These processes are known as '*Sodhana*', and are very tedious and complicated."[5] "Modern chemical methods of purification are preferable to the old 'Sodhana' processes".—(Chopra).

Action.—" '*Makaradhwaja*' and other sulphides of mercury in a fine state of division undergo solution in 5 c.c. of a 0.2 per cent solution of HCl at 100°F. in an hour. This is also true when these sulphides are digested with filtered gastric juice obtained artificially from a healthy patient. If sulphide of mercury is broken up in this manner by the acid of the gastric juice, it is likely that absorption will take place.—(Ghosh). Experiments on animals have shown that '*Makaradhwaja*' is not absorbed either from the stomach or from the small intestines. It is, however, likely that very minute quantities are absorbed and excreted and the ordinary chemical tests are not sensitive enough to detect its presence. Further investigations with improved methods of identification of mercury are, therefore, called for.

"Excretion of '*Makaradhwaja*' in urine of healthy, young men who were under strict control, was studied by a new analytical method of Booth, Schreiber and Zwick (1926), and no

traces of mercury were detected. Excretion of '*Makaradhwaja*' in stools is also being studied by the same analytical method, and the results have to be called for from the Tropical School Indian Medicine, Calcutta."[6]

"Recent work (upto 1932) has shown that the mercury ion in a high state of dilution has a definite stimulant action on animal tissues. One in one mission of mercuric chloride added to the perfusate distinctly stimulated the isolated mammalian heart and increased its force of contraction. It is, therefore, likely that if absorption does take place in very small quantities, '*Makaradhwaja*' would produce a stimulant action on the heart."[7]

"It is quite possible that in '*Makaradhwaja*' we have an insoluble preparation which by action of the gastro-intestinal juices is rendered absorbable to such an extent that minute quantities of mercury ions sufficient for stimulation of the tissues and no more, are taken into the system and are acting on the tissues".—(Chopra).[8]

Administration & Uses.—"*'Makaradhwaja' is seldom used alone.* In the majority of cases, it is mixed with various drugs called '*anupana*' or adjuvants. In cases of indigestion and diarrhoea, '*Makaradhwaja*' is mixed with powdered Aegle marmelos fruit; for fever and cough it is given with the juice of ginger, pepper, betel leaves, and leaves of *Ocinum viride;* in heart disease, it is combined with musk. In the absence of proper '*anupana*' (adjuvant), honey may be used in every case".[9] "The usual procedure is to take a dose (approximately one grain) of '*Makaradhwaja*' daily with 60 drops of the '*anupana*' or honey or other suitable adjuncts, and rub it for sometime in a stone mortar before administration",[10] and given in general and nervous debility, in convalescent patients after acute illness, brain fatigue from excessive mental work, habitual constipation, womb complaints after delivery, spermatorrhoea etc. "This may be used both for adults and children, the dosage being regulated according to age."[11] Mixed with some stimulant drugs, viz: camphor, nutmeg, black pepper and cloves each 4 parts and musk 1/16 part to

every part of *Makaradhwaja*, it is used as an aphrodisiac under the name of *Chandrodaya Makaradhwaja*. Dose is one pill of ten grains, each given with milk or enclosed in betel leaves to be chewed. Diet ought to be generous consisting of milk, ghee, pulses etc. It is useful in nervous debility, impotence, premature old age etc. A pill named *Brihat Kaphaketu* which is made up of gold, pearl, burnt coral, mica and *Makaradhwaja*, made into pills with mother's milk is generally used in the asthma of children, with irregular pulse and cold extremities. '*Makaradhwaja*' when taken regularly as per the indigenous system of medicine is a wonderful tonic and will increase the longevity of the patient".[12] "In failing circulation and in cardiac asthenia, it is a sovereign remedy. Tried in some cases of myocardial disorders following acute specific fevers, have shown distinct clinical improvement; yet, further trials are necessary. '*Makaradhwaja*' is also used as a laxative with good results, particularly in those cases when there is visceroptosis and atonic condition of the gastro-intestinal tract. As an intestinal antiseptic also, it is said to be of great utility and is supposed to relieve the gaseous distension of the bowels due to fermentation".[13] *Brihat Kasturi Bhairab* containing gold, silver etc. (mentioned under "Arsenic") is useful in dyspnoea with fever, collapse, delirium etc. In dyspnoea of phthisis and *prameha, Brihat Kanchanabhra* is recommended; it consists of gold, silver, copper, tin, iron, mica, pearl, coral, *Rasasindur, Baikranta,* musk, cloves and mace. An exhaustive list of preparations containing gold as used in a large number of diseases is given in the "Journal of Ayurveda" of March 1925, to which the reader may refer. Dr. H. C. Sen highly commends the use of chloride of gold in low continued fevers, especially of typhoid state, for "keeping up the vital centres and heart". He generally used oxide or chloride of gold in very small doses. To prevent spasms and to give tone to the nervous system he used the bromide of gold "With satisfactory results". He used chloride of gold in doses of 1/20 to 1/12 of a grain in many cases with or without the decoction of Semecarpus anacardium to remove the tremors noticed in the muscles of the wrist and fingers of patients

exhausted from continued fevers and to steady the functions of the brain after meningeal troubles. The chloride of gold has been much lauded as a remedy for confirmed dipsomania. The tribromide of gold (dose ¼ to ½ grain in pill made with Kaolin) is used for hysteria, epilepsy etc. The use of gold in tuberculosis is also recommended by some modern western authorities:—"In 1890 Koch showed that a salt of gold inhibited the growth of tubercle bacilli in a solution as weak as one in a million. In 1917 Felot and Spies introduced a preparation of gold named "Knysolgan" which was used in the treatment of tuberculosis. Prof. Holger Moellgaard has a new inorganic compound of gold and sodium under the name of "Sacrocrysin" which is said to materially check the growth of tubercle bacilli in a solution of one in a million and to arrest it completely in a solution of one in 100,000. Serum from a tuberculous animal was given by intramuscular injection in doses of 20 to 40 cc. m. and proved potent in counteracting the tuberculin shock caused by the sacrocrysin. In non-technical language, a serum is injected into the blood to prepare it for digesting the dead tuberculosis bacilli. Either before or after the blood is thus prepared, a new substance "Sanocrysin," is injected in weak solution; Sanocrysin kills the bacilli; the serum eliminates the poisons which have been caused by the presence of the dead bacilli. Sanocrysin according to "Medical Science" review, is a compound salt of gold and sodium. It is a solid snow-white substance composed of long needlelike crystals. Its activity is amazing. A solution of 1 in 100,000 kills the bacilli and of 1 in 1,000,000 prevents its growth. Sanocrysin without the serum kills the bacilli, but it also kills the patient when it is tried on animals. But where its administration is combined with a serum it has healed animals even when the case was an advanced one. Upto 1927 the use of Sanocrysin was only in its infancy, but good medical opinion held that the world was on the eve of a discovery which might revolutionise treatment and perhaps exterminate tuberculosis! Refer 'Hydrargyrum' also for some more information.

(1) to (13)—Chopra's "I.D. of I." pp. 414/421.

## 16. CALCIUM (Eng.—Lime)

Several sorts of lime are used in Hindu medicine; thus we have lime from Limestone (*Sans.*—Churna); Calcined cowries (*Kapardaka bhasma*); Conch shells (*Shankha bhasma*); Bivalve shells (*Shukti bhasma*); Snail shells (*Shambuka bhasma*). The various kinds of lime are found free in nature. These shells are purified by being soaked in lemon juice and are prepared for use by being calcined within covered crucibles. Lime is used internally in dyspepsia, enlarged spleen and other enlargements in the abdomen and externally as a caustic. Lime enters into the composition of a great many prescriptions of different sorts of dyspepsia; *e.g.*—A compound pill called *Amrita Vati* prescribed in Bhaishajyaratnavali for loss of appetite and indigestion contains calcined cowries, aconite and black pepper in 5, 2 & 9 parts respectively, made into two-grain pills. In the same is mentioned another compound pill named *Agnikumara Rasa* containing calcined cowries, conch-shells and aconite 3 tolas each, borax, mercury, and sulphur 1 tola each, and black pepper 8 tolas, all rubbed together for 12 hours with lime juice and made into twelve-grain pills. This medicine increases appetite and cures indigestion. Bhavaprakash recommends calcined conch-shell (*Shankha bhasma*) in half-drachm doses to be taken with lime juice in enlarged spleen. In jaundice, urinary trouble and acidosis a preparation called *Krimi-dhulijalapraba Rasa* containing *Shankha bhasma*, tin, mercury and sulphur and emeblic myrobalan has been recommended—(Jour. of Ayur. Oct. 1925). As a caustic, lime is used in various combinations for different diseases; *e.g.*:—as an application to enlarged glands and tumours, a mixture of Conch-shell lime (*Shankha bhasma*), impure carbonate of soda (*Sarjika*) and the ashes of Raphanus sativus is recommended by Chakradatta. A mixture of lime, carbonate of soda, sulphate of copper and borax is applied as a caustic to tumours and warts. As a *depilatory*, a paste made of Conch-shell lime 3 tolas, orpiment and the ashes of Butea frondosa one tola each rubbed together with the juice of plantain stalks or of Calotropis gigentea, is mentioned in Sharangadhara. It is applied seven times to the part from which the hair is to be removed.

## 17. CALCII CARBONAS; or CALCIUM CARBONATE

(*Eng.*—Chalk; marble. *Hind.*—Vilati-chuna. *Ben.*—Karimatti. *Arab.*—Kits. *Pers.*—Gil safed. *Guj.*—Chaka. *Tam.*—Seemaychunnambu. *Mal.*—Kapur ingris. *Burm.*—Tounghpyu) occurs in nature as lime-stone, white marble etc. It consists of infinitesimal shells composed mostly of carbonate of lime contaminated with iron oxide, clay, organic matter etc. and forms rocky beds. Chalk exists in plants and can be obtained by reducing them to ashes. In the animal kingdom it is found in the hard parts of Corals and in oyster shells. Thus it exists in all the three kingdoms of Nature. Carbonate of lime is an ordinary ingredient of mineral and common waters. In crystallized form it is known as calcareous spar. The crusts which envelop crabs and lobsters are made of carbonate of lime mixed with phosphate of lime. In the bones of animals they are met with in equal quantities. Chalk occurs in irregular, white, amorphous pieces, sometimes as a powder. Prepared chalk or *Creta Praeparata* is a native friable carbonate of lime freed from impurities by elutriation *i.e.*, the chalk is powdered, washed with water, decanted and allowed to subside. The sediment left is a pure carbonate of lime free from soluble salines and flinty and sandy matters. Prepared chalk or *Cretae* (*Fr.*—Craie. *Ger.*—Kreide. *Hind.*—Khariya. *Ben.*—Khari) administered internally neutralises the free acid of the gastric juice; it is useful in dyspepsia due to acidity of the stomach, and to check sour eructations; in gout with excessive uric acid and in rickets (rachitis) with a deficiency of lime in the system. Dose is 5 to 20 grains of the powder. Prepared chalk is an antidote to poisoning by minerals. *Externally* chalk is used as a desiccant, absorbent and an antacid; useful in slight abrasions and burns, intertrigo of children, and erysipelous inflammations. For scalds which have much injured the skin, application of chalk ointment is useful. Matron Crooks recommends for burns the application of a mixture of chalk and linseed or olive oil with the addition of vinegar just enough to reduce it to the consistency of treacle or thin honey. Each renewal is said to bring "fresh relief and a most gratifying coolness".—(Health, Nov. 1925). In

purulent discharges from ulcers, in combination with burnt cocoanut shell it is useful; it brings about a healthy action and lessens the discharge.

*Red Chalk* is a kind of earth of red colour; *Lat.—Ferrum Haematite* (*Sans.*—Suvarna Gairika. *Ben.*—Lalgiri-mati. *Hind.*—Sitageru. *Eng.*—Red Ochre. *Fr.*—Ocre rouge). It consists of the mixture of the hydrated sesqui-oxides of iron with various earthy materials principally Kaolin and Quartz. It is used as an antidote to arsenical poisoning. It is "sweet, astringent, cooling, antibilious, anti-phlegmatic, generative of bile, preventive of haemorrhage and beneficial in hiccup, piles, vitiated blood, poison and burns. The electuary prepared with its powder and honey instantly relieves the hiccup of children.—(N. N. Sen Gupta).

---

## 18. CALCII HYDRAS

Calcii hydroxidum; Calcium hydroxide; Calci hydroxide; Calcium hydrate (*Eng.*—Slaked lime. *Sans.*—Churnā. *Hind.*—Chuna. *Ben.*—Chun. *Punj.*—Kalai. *Guj.*—Chuno. *Tam.*—Chunambu. *Tel.*—Sunna. *Arab.*—Kils; Ahu. *Pers.*—Nurah. *Burm.*—Thon-phiyu) enters into the composition of numerous compound powders and used in the cure of dyspepsia. Locally it is applied to tumours and warts. Lime water is prepared by adding two ounces of slaked lime to a gallon of water and decanting off the supernatent clear fluid after the whole mixture has been allowed to stand for a time. —(Chopra). Lime water given internally forms a good antacid in dyspepsia and heart-burn; it is given with milk to children in acidity of the stomach. Dose is 1 to 4 drachms, for children. Another form called the Saccharated solution of lime, better adapted for administration to infants and children, is prepared by carefully mixing together in a mortar one ounce of slaked lime and two ounces of powdered white sugar and adding this to a pint of water and shaking well and allowing it to stand for some hours. The supernatent liquid should be kept in a well stoppered bottle. Dose is 15 to 20 drops in milk twice or thrice daily. The uses of lime water are many and varied:—In

acidity of the stomach, in heart-burn, in those forms of digestion due to acidity of the stomach and of indigestion, when the urine is scanty and high colored and when vomiting and acid eructations are prominent symptoms, lime water is best given in milk, in doses of 1½ to 2 ounces of the lime water. In diarrhoea arising from acidity it is best given in a solution of gum arabic or other mucilage; in obstinate cases 10 drops of laudanum may be added to each dose. It may also be advantageously combined with omum water. In chronic dysentery the same treatment in addition to enemas of lime water diluted with an equal part of tepid milk or mucilage has been beneficial. In the diarrhoea and vomiting of infants and young children, resulting from artificial feeding one part of lime water diluted with four to six parts of milk is suitable and the saccharated solution of lime internally is also of great service. Obstinate vomiting, diarrhoea, in consumption, in poisoning by mineral acids, vomiting attendant on the advanced stages of fever, even the black vomit of yellow fever, and pyrosis or waterbrash sometimes yield to a few doses of lime water 4 or 5 ounces being added to a pint of milk. In scrofula and in those cases in which abscesses and ulcers are continually forming, and also in cases of warts of children, lime water in doses of half ounce in milk three or four times a day and preserved for some time has proved beneficial to some extent. In consumption as well as in diabetes lime water and milk has been strongly recommended as an ordinary beverage. In poisoning by any mineral acids, and also arsenic, lime water given plentifully in milk is an antidote. *Externally,* "Calcium popularly used in the form of lime-water, is a well-known remedy in all inflammatory swellings"—(Chopra), in pruritus ani and pudendi (distressing irritation of the genital organs), bathing the parts well with tepid lime water three or four times a day affords much relief. Leucorrhoea and other vaginal discharges have in some instances been mitigated and even cured by the use of injections of a mixture of 1 part of lime water to 2 or 3 parts of water. Scrofulous and other ulcers with much discharge have been found to improve under the use of lime water as a local application. For syphilitic ulcers or chancres one of the best applications is a mixture of lime

water half a pint and calomel 30 grains (commonly known as Black Wash); it is constantly applied to the part by means of a piece of lint or clean rag moistened with it. Many forms of skin diseases attended with much secretion and with great irritation or burning, burns and scalds, and sore or cracked nipples are benefited by using lime water as an emollient, either pure or conjoined with some bland oil. Diluted with equal parts of water or milk it forms a useful injection in discharges from the nose and ears occurring in scrofulous and other children. For thread worms in children, enemas of 3 or 4 ounces of lime water repeated two or three times have sometimes effected a cure. To burns and scalds lime liniment called Carron oil, composed of equal parts of lime water and a bland oil (olive oil or sesamum oil, perferably linseed oil) thoroughly shaken well together so as to form a uniform mixture is a popular remedy; the parts scalded should be kept covered with rags constantly wetted with the liniment. This liniment on cotton wool applied to the pustules of small pox is said to prevent pitting.

---

## 19. CALCII OXIDUM

Calcium Oxide or Calx or Lime Ko (*Sans.*—Sudha; Shudhakshara. *Eng.*—Burnt lime; quicklime; caustic lime. *Hind.* & *Ben.*—Kalika-chuna; Chunam. *Arab.*—Kilo; Apag. *Pers.*—Ahaka-nurch. *Punj.* & *Kash.*—Chuna; Chun. *Guj.*—Kalichuno. *Mah.* & *Kon.*—Chunno. *Can.*—Sunna. *Tam.* & *Tel.*—Chunnambu; Kar-shunnambu. *Tel.*—Sunnam; Rallasunnamu. *Mal.*—Nura. *Burm.*—H'tonphia. *Sinh.*—Hunnoo. *Malay.*—Kapor) is an alkaline earth occurring in both the mineral and vegetable kingdoms. In the mineral kingdom it is found combined in the form of carbonate, sulphate, phosphate, silicate and biborate of lime. Flourspar is a combination of lime with fluorine etc. In the vegetable kingdom it is found in combination with vegetable acids. It is obtained by calcination or by burning chalk, marble or lime stone with coal or coke in a wind furnace known as kiln. It exists in light lumps of dirty white colour; it slakes rapidly if water is

poured upon it, leaving a white, bulky powder. Lime is made from burnt shell or lime stone. Its action is antacid. It is of a pungent, acid and caustic taste and slightly soluble in water. It is called slaked lime (*Calcium hydrate*) and the water above is lime water. Slaked lime, the residue left after removing lime water is a soft white powder of a strong alkaline taste and reaction. Lime water is obtained by pouring water on recently burnt lime, or when vapour ceases to be disengaged set it aside to cool. It is also obtained by adding water to slaked lime and shaking well for a few minutes and allowing it to settle down for about twelve hours. The supernatent liquor is lime water. Quick lime shell or unslaked lime is used as a caustic. A *paste* made of quick lime and pearl ash equal parts is a useful application to remove warts. An ointment prepared by mixing well 3 parts of butter and 1 part of wet *chunam,* lightly applied to developing witlow, twice daily, morning and evening, cures it. Mixed with sulphuret of arsenic it is used as a cure for indolent ulcers. In ringworm or Dhobie's itch an application made of quick lime 1 ounce and precipitated sulphus two ounces boiled in 15 ounces of water until reduced to 10 ounces and then the water decanted, is used every night for three or four days for a cure. In combination with sulphuret of sodium, sulphuret of barium or sulphuret of arsenic in the proportion of 3 to 1, it is used to remove superfluous hair. For this purpose a *paste* made of quicklime 4 parts, yellow orpiment 2 parts, seeds of Butea frondosa 2 and Calotropis gigentea 3 parts is in general use. It is also useful to destroy noevi and is a useful caustic application on the bites of rabid dogs. In neuralgic headache, applied to the part, it gives relief; applied to relieve painful and gouty joints. For this purpose a *paste* made of quick lime 2 parts and the gum resin of Garcinia pictoria or morella (gamboge) 3 parts is used. Quicklime is also useful in jaundice, acidosis, urinary trouble and enlarged glands.

---

## 20. CALCII SULPHAS ($CaSo_{42}H_2O$), or HYDRATED CALCIUM SULPHATE

(*Sans.*—Sanjirahat. *Eng.*—Alabaster; Plaster of Paris; Exsiccated Calcium Sulphate; Gypsum; Satin Spar. *Sind.*—Karicheri. *Pers.*—Sangmakrani. *Hind.*—Sufed Pathar. *Guj.*—Gabhana. *Mah.*—Godanti; Haratala) in primitive form occurs generally in long, flat, dirty-white or 'alabaster' whiteness, transparent scales, crystals or regular four-sided prisms, and is an hydrous sulphate finely grained, cut to the shape of an egg, having a fibrous structure and a pearly opalescence. Action:—Plaster of Paris is cooling, antacid and astringent. For medicinal purposes it is prepared by overburning and then grinding the ashes and is then known as Plaster of Paris (*Latin.*—Gypsum selenite; *Hind.*—Kulnar) or carbonate of lime. *Plaster of Paris* is used to retain broken bones in a fixed position. In fracture of the limbs and ribs and in diseases of the spine it is useful. Carbonate of lime-ash is well rubbed in curd and then locally applied to painful and swollen parts or to the chest with relief. Internally it is an astringent and antacid and is useful in menorrhagia and acidity of the stomach, and is given as gruel in fever. In inflammation round the ear, a paste made of Carbonate of lime 5, alum 5 and *Gile-armani* (Silicate of alumina, magnesia and oxide of iron) 4 parts is applied outside the ear; in otorrhoea it may be dropped into the ear.

---

## 21. CARBO LIGNI

(*Eng.*—Wood charcoal; Medicinal charcoal. *Hind.*—Lakrika-koyelah. *Duk.*—Lakrika kolsa. *Ben.*—Kash-tha-koyala. *Mah.*—Lakdacha-kolsa. *Guj.*—Lakdu-koelo. *Punj.*—Koilah. *Kash.*—Tsuing. *Tam.*—Aduppu-kari. *Tel.*—Katta-boggu. *Mal.*—Muttikari. *Can.*—Kattige-iddalu. *Burm.*—Then-muswe. *Sinh.*—Anguru. *Malay*—Ahrang) is an important article from the sanitary, medical as well as economical point of view. It is used as a deodoriser in sickrooms by hanging this muslin bags loosely filled with roughly powdered *charcoal;* the charcoal requires to be renewed occasionally.

Water is purified by boiling it with a good-sized piece of freshly prepared charcoal. Charcoal is used in respirators and sewer traps to protect from poisonous gases. It also forms an excellent filter placed in alternate layers with river sand. Finely powdered charcoal mixed with fine powder of the Areca or Betel nut forms an excellent toothpowder. Charcoal poultice made by adding finely powdered charcoal to a common rice poultice in the proportion of one part of the former to three or four of the latter, with a little charcoal powder also sprinkled over the surface of the poultice is an esteemed application to foul ulcers and wounds. An efficient charcoal poultice is made up of 2 ounces of bread crumb boiled in 10 ounces of water for 10 minutes, then 1½ ounces of linseed meal or rice flour added and the whole stirred to form a poultice to which ¼ ounce of wood charcoal is finally added, and a like quantity of dry charcoal is sprinkled over the surface of the poultice. It corrects bad odour and stimulates healthy action. *Internally* a mixture of charcoal and rhubarb powder 5 grains each is given after food in dyspepsia with benefit; also in flatulence and acidity of the stomach and intestinal tract; also in diarrhoea, dysentery and typhoid fever charcoal powder is used internally as antiseptic and stimulant, in biscuit or capsules. The most palatable way is to mix it with chocolate. Dose is 1 to 2 drachms. Charcoal of Butea frondosa has the property of decolorising like animal charcoal. Dry charcoal has the power of condensing oxygen within its pores which then becomes a powerful oxidiser rapidly destroying organic substances. When thoroughly wetted it loses this power.

---

## 22. CUPRUM

*Sans.*—Tamra; Shulva; Ravi; Mlechha-muka. *Eng.*—Copper. *Arab.*—Nehass. *Fr.*—Cuivre. *Ger.*—Kupfer. *Pers.*—Misa. *Hind.*—Tamba. *Beng.*—Tama. *Assam.*—Tam. *Guj.*—Trambo. *Mah. & Kon.*—Tambay. *Tam.*—Shembu. *Tel.*—Tamberam; Ragi. *Can.*—Tambra. *Mal.*—Tambaga. *Burm.*—Kyani.

Source.—Found extensively free in the metallic state and also in various combinations as sulphide in copper pyrites and as carbonate, phosphate, and arsenate; with oxygen as cuprous or red oxide and as cupric or black oxide. Copper ores are found in several of the independent States of Rajputana, and in the districts of Ajmer, Singbhum and Hazaribag (Bengal). In minute quantities it is found in natural springs and in the animal and vegetable organisms.

Characters:—A brilliant, sonorous, ductile metal of a reddish colour; impure copper is black; when mixed with impurities it breaks on being hammered. Copper is a good conductor of heat and electricity. Its chief solvent is nitric acid. Its most important alloys are four.—(1) Brass (an alloy of copper with 25-40% of zinc). (*Sans. & Indian Languages:*—·Pittal. *Pers.*—Biring. *Tel.*—Atdi. *Can.*—Hittali). After purified and reduced it is said to be "saltish, bitter, cool and beneficial in jaundice, worms and spleen."—(N. N. Sen Gupta). Calx of this compound metal is used as tonic and alterative. A preparation called *"Pittal Bhasma"* is advertised as astringent, expectorant and diuretic useful in bleeding piles, anaemia, colic, asthma and other lung complaints. Dose is 2 to 4 grains with milk; *Brass* is of two kinds—*'Ritika'* and *'Kakatundi'*. The former on being heated and plunged into sour gruel turns copper-coloured. Brass, which is heavy, soft, of yellow colour, capable of resisting strokes, is to be recommended. Brass, which is light and of offensive odour, is not good for medicinal purposes. Brass, smeared with a paste of lemon juice, orpiment and sulphur and roasted 8 times, is reduced to ashes. The process of killing brass is the same as that of copper.—(Sir P. C. Ray's H. of H. Ch., Vol. I, Page 114). (2) Bronze (*Sans.*—Kansa; Kansya. *Pers.*—Roeen; Taliqun) contains 12 p.c. of tin, also a little zinc, copper and lead; (3) Bell metal (an alloy of copper, zinc, tin and antimony) (*Sans.*—Kansa· *Pers.* —Tualiqun. *Hind. & Ben.*—Kansa. *Guj.*—Kanso· *Mah. & Kon.*—Kanshe. *Tel. & Can.*—Kanchu) contains 25 p.c. of tin. *Bell-metal* is also made by melting together 8 parts of copper and 2 parts of tin. It is completely killed by being roasted

5 times with sulphur and orpiment.—(Sir P. C. Ray). (4) German Silver, an alloy of copper, zinc and nickel. Bell metal and Brass are sometimes used in combination with other metals as for example, in the preparation called "Nityananda Rasa." They are regarded as tonic and alterative. They are purified and reduced to powder in the same way as copper.

*Vartaloham:*—is produced from Brass, copper, bell-metal, iron and lead; hence it is regarded by metallurgists as an alloy of 5 metals........It is killed with the aid of sulphur and orpiment.—(Sir P. C. Ray).

"There is a copper ore, bornite or erubescite ($Cu_3FeS_3$) which, on account of its peculiar colour and iridescence, is known as 'peacock' ore. It occurs in several parts of India". —(Sir P. C. Ray, in H. of H. Ch., Vol. I, Page 138).

Preparations.—Thin plates of copper which can be pierced by a pin are purified by being boiled in cow's urine for three hours; then reduced to powder by smearing the thin leaves with a paste of sulphur and lemon juice and beating them into a mass and exposing to heat in a covered crucible within a sand-bath for 12 hours. The powder thus produced is rubbed with *Kanjika* (fermented rice or paddy liquor) and made into a ball which is introduced into a tuber of Amorphophallus campanulatus as in a crucible and roasted. When cool take out the ball and powder; the sulphide of copper thus produced is innocuous; this last process is called *Amritakarana* which makes copper fit for internal use, freeing it from its toxic effects of causing purging, vomiting, vertigo etc. The copper powder (*Tamra Bhasma*) is a dark-black powder, somewhat gritty to the feel. Another method of preparing Copper *Bhasma* is by rubbing together mercury ½ and sulphur 2 parts in the juice of Calotropis gigentea and adding old copper coins (which are supposed to be of purer copper than new ones) and submitting the whole to processes of oxidation and calcination as in the preparation of gold or silver *bhasma*. Dose is ½ to 1 grain. As alterative, the dose is 2 to 4 grains. As emetic, in cases of poisoning, the dose is 24 grains with sugar or honey.

Action.—Astringent, sedative, antispasmodic, alterative, antiseptic, emetic and purgative. In small doses it is astrin-

4

gent; in large doses it is alterative and in very large doses it is emetic. Copper is absorbed from the stomach, intestines and mucous membranes probably as a colloid and stored up in the liver, small amounts being found also in the spleen and kidneys. It is excreted by the liver, kidneys and the salivary and intestinal glands. Colloidal copper increases activity of cell-metabolism—(Dr. Gers. Med. Press 1910).

Uses.—Copper enters into the composition of several medicines for ague, remittent and relapsing fevers, heart disease, skin diseases, phthisis, enlarged spleen etc. Copper is used in combination with aconite and the juice of *dhatura* leaves, in epilepsy, gout and rheumatism; also in chronic skin diseases, leprosy, asthma, chronic diarrhoea and gonorrhoea. As antiseptic copper salts are good in diarrhoea and bacterial infections *e.g.* Bacilli Coli. Owing to its antiseptic qualities ancient Hindus preserved water in bright copper vessels *(Tamra-patra)*. *Externally, Tamra-Bhasma* is recommended in Ayurveda for local application in piles, leprosy, skin-diseases, and ozoena. Modern researches have shown colloidal copper to be useful in cancer. It diminishes pain and produces marked improvement. Internally prepared copper in small doses (gr. 1 to 2) is considered valuable for chronic diarrhoea and sprue —even cholera. Copper is highly poisonous to lower forms of plant life, but not so on the higher forms of either plant or animal life. Copper has been used "in all forms of cholera and diarrhoea with uniform success and satisfaction. Its greatest usefulness is in the prevention of all these diseases, the most important of which is typhoid fever"—(C. Wifekofi Cummins in Jour. of Med. Soc. of N. J., June 1912). The effect of 1/24 grain of copper sulpho-carbolate on choleraic diseases is marvellous; all of the serious symptoms abate in a few hours. When using the copper nothing is used to control the diarrhoea directly unless it seems to be too debilitating. Then a little camphorated tincture of opium is added and perhaps some cinnamon. In flatulent swelling of intestines and Tabes Mesenterica *(Gulma),* prepared copper in two-grain doses rubbed with ginger juice and enclosed in betel leaf is useful—(Rasendrasara Sangraha). A compound

preparation known as *Gulma Kalanala Rasa* is recommended in this disease; it is given in doses of 8 grains on empty stomach mixed with honey and a decoction of chebulic myrobolans. As antiseptic, prepared copper is useful in small intestinal worms—(Rajanighantu); it may be tried in hookworm. The same recommends it in acid dyspepsia as an alterative, sedative and antiseptic. Prepared copper in small doses is useful in bronchitis as an expectorant and also probably for its effect on the bronchial nerves. This *(Tamra bhasma)* "was tried given with honey in a few cases of asthma and bronchitis and found to give relief in those cases"—(Ind. Drugs Report, Madras). As an emetic in large doses it is useful to expel excessive mucous from respiratory tract; also in asthmatic fits caused by the Vagus reflex. For this, Sharangadhara recommends a preparation of copper named *Suryavartta Rasa.* In phthisis also it is recommended. In this disease Nighantu Ratnakar recommends a preparation called *Tamraparpati* in ½ to 2 grain doses. In modern times Luton has reported favourably on the use of copper in tuberculosis. —(Prev. Med., Dec. 1912). *Jalodarari Rasa* containing copper and 1/3 grain of croton seed with other ingredients in each pill is recommended in ascites and dropsy.

*In case of acute poisoning from use of unprepared Copper* (no case of poisoning from the "rectified" copper preparations of Ayurvedic Pharmacopoeia is known to have occurred) with violent gastro-intestinal symptoms, potassium ferro-cyanide should be given at once followed by demulcents such as milk and ghee or infusion of *Isaphgol.* To relieve pain apply counter-irritant over abdomen and give opium. For chronic poisoning produced by taking small quantities for a long time, with symptoms of gastro-intestinal irritation, pharyngeal and laryngeal catarrh, anaemia and wasting, profuse perspiration and nervous symptoms,—Saline purgatives for daily evacuation, large quantities of milk and ghee and freshly made infusion of *Isaphgol* are to be given.

---

## 23. CUPRI SULPHAS, or CUPRUM SULPHAS, or CUPRIC SULPHATE

(*Sans.*—Sasyaka; Tutta; Nella tutia; Tuttham; Mayura tuttham; Sikhigrivam. *Eng.*—Verdigris; Crude Copper sulphate or Copper acetate; Basic Copper acetate; Blue copperas; blue stone; Roman vitriol. *Beng.*—Tutia. *Hind. & Punj.* —Nila-thotha; Nila tuta. *Guj. & Duk.*—Mor-tutta. *Malay.*— Toorshi; Turi. *Burm.*—Doutha. *Tam.*—Mayil-tuttam; Tuttam turichi. *Tel.*—Mayilu-tuttam. *Can. & Kon.*—Mayil-tuttu. *Sinh.*—Palmanikam. *Arab.*—Zajul-akhzar. *Pers.*—Zake-sabz) is prepared by roasting copper pyrites with sulphur, dissolving the roasted mass in water and evaporating the solution to obtain the dark-blue crystals of the sulphate. Copper sulphate occurs in blue crystalline masses. "Blue vitriol is indeed a semimetal of copper as it is derived from copper"— (Bhavaprakash). The stuff obtained from the bazar is usually impure. It may be purified by dissolving in water and recrystallising, and for internal use it is purified by being rubbed with honey and/or ghee and exposed to heat in a crucible; it is then soaked for three days in whey or water, and dried in the sun. Copper sulphate thus prepared will be free from toxic effects and will not produce vomiting. Its incompatibles are alkalies, lime water, mineral salts (except sulphates) and most vegetable astringents. It is a powerful astringent, emetic and antiseptic; externally stimulant, styptic and mild caustic. Dose, as an astringent is 1/8th to 2 grains; as an emetic it is 5 grains, used in cases of poisoning by narcotics such as opium, nux vomica, arsenic etc. In chronic diarrhoea and dysentery, purified copper sulphate in doses of ¼ to 2 grains is beneficial; and in the diarrhoea of the advanced stages of phthisis, copper sulphate and opium ½ grain of each in pill form, mixed with honey is given thrice daily. It is contained in medicines named *Grahanikapata Rasa* which is useful in bowel diseases such as chronic diarrhoea and dysentery and especially sprue; in *Garbhabilasa Rasa* or *Sutikabindu* (Rasendrasarasangraha) which are recommended for puerperal diseases like puerperal diarrhoea, and indigestion during pregnancy; in *Jayamangala Rasa, Mahamrityunjaya Lauha,*

*Putapakwavisamajwarantaka Lauha*, *Jvarankusha* (Bhavaprakash) and *Chaturthakari* (Bhaisajyatantra) which are used in intermittent and relapsing fevers with enlarged spleen and liver. In cases of diarrhoea in children a mixture made of copper sulphate 2½ grains, *Ajowan* water 2 ounces is useful in doses of a teaspoonful thrice daily. In cases of diphtheria and croup in children a solution of copper sulphate (5 grains to an ounce of water) in teaspoonful doses every ½ hour till vomiting is produced, is useful. In cases of poisoning, copper sulphate 4 grs. dissolved in hot water is given every few minutes till vomiting occurs. *Externally* copper sulphate is applied to indolent ulcers, exuberant granulations, sinuses and fistula in ano in solid or preferably liquid form as solution (2 grains gradually increased to 10 in an ounce of water). An ordinary *"pichu"* or clean cotton or a piece of cloth boiled in *Samundra lavana* 1 tola in 1 measure or *Padi* of water, and these cloth pieces preserved in wide-mouthed glass bottles so as not to be contaminated with dust, are used in lieu of gauze etc., as dressings for wounds. Where *sodhana* is required, these cotton pieces may be dripped in a solution of *Tutha* (copper sulphate) 1 grain to 4 ounces of solution, and applied. For foul and obstinate indolent ulcers, Chakradatta recommends an ointment of copper. An ointment known as Oleatum Cupri (B.P.) is highly recommended in parasitic diseases of the skin, in ringworm, indolent ulcers etc. In prickly heat a solution of copper sulphate in rose water (1 in 50) often gives relief. In ringworm an ointment made of copper sulphate 10 grains, powdered galls 1 dr. and an ounce of ceromel, rubbed on the affected parts, though it smarts, is very effective. In eye diseases, Chakradatta recommends a weak solution of Copper sulphate (1 in 500) to be dropped into the eye in opacity of the cornea. A half per cent solution (copper sulphate 2 grains, alum 2 grains and water one ounce) may be used in conjunctivitis and ophthalmia with copious discharge. In haemorrhage from the nose (i.e., epistaxis) and other forms of bleeding from mucous surfaces, solution of copper sulphate 4 grains to 1 ounce of water, is effective as a nasal douche even when alum fails. If there is excessive bleeding from wounds, due to leech-bite, application of a little powdered

copper sulphate is useful when alum fails. In leucorrhoea and gonorrhoea it may be used as an astringent and antiseptic vaginal or urethral injection. In ulceration of the mouth copper sulphate 2 grains in a little honey may be applied to the ulcers. In cases of poisoning by opium, *dhatura,* nux-vomica, Cocculus indicus, aconite, arsenic etc., (where immediate emptying of the stomach is necessary and not in other cases) copper sulphate solution (5 grains in a pint of tepid water) given at a draught acts promptly as a good emetic; this may be repeated a second or third time *if necessary.* Vomiting is promoted by copious draughts of warm water. If the sulphate causes any unpleasant effects the white of egg is the best remedy. In cases of burns from phosphorus, cotton pads soaked in 1 per cent solution of copper sulphate are useful; this immediately coats the phosphorus with a black layer and renders it inert".—(Dr. D. C. Walton—J. Amer. Med. Assoc.). For spongy gums Aksir-ul-Imraj recommends an application made of copper sulphate, alum, pellitory root, black pepper, each 2 *mashas* and honey 1 tola; it is to be applied to the gums. Vaidyas prepare a collyrium called *"Tutham"* or *"Tuttanjana"* made of copper sulphate and root of C. luteum. (See—C. luteum).

---

## 24. FERRUM

*Sans.*—Lauha; Hyam. *Eng.*—Iron. *Arab.*—Hadida. Pers. —Ahana. *Urdu.*—Lohchun. *Hind., Ben. & Duk.*—Loha. *Guj.*—Lodhun. *Mah. & Kon.*—Lokhand. *Can.*—Kabbina. *Tam.*—Irimbu. *Tel.*—Inumu. *Sinh.*—Yekada. *Burm.*—Than. *Malay.*—Basi.

Source.—Rarely met with free in nature, though very widely distributed in both the organic and inorganic kingdoms. Found in nearly all rocks, soils, etc., variously combined with oxygen as haematite, magnetic iron ore etc., with sulphur as iron-pyrites, and as carbonate of iron, in spathic iron; in the ashes of plants and even the blood (red corpuscles of the blood) of animals; also in the bile, chyle, gastric juice, lymph, milk, pigment of the eye and in the urine.

Classification.—According to Rasaratna Samuchchaya there are three varieties of iron:—(1) Cast or Wrought Iron *(Mundam)*, which is again sub-divided into three varieties: (a) *Mridu* is that variety of iron which easily melts, does not break and is glossy; (b) *Kuntham*, that which expands with difficulty when struck with a hammer, and (c) *Kadaram*, that which breaks when struck with a hammer and has a black fracture. (2) Steel, i.e., properly cast-iron; *(Tikshnam)*— which is again of six varieties: (a) *Khara*—rough, free from hair-like lines and on breaking shows the lustre of quicksilver and break easily by bending; (b) *Sara*—the variety which breaks in the sides by hammering; it has hair-like lines and is a product of brown soil; (c) *Hrinnala*—it is black in colour, shows seed or beak-like lines and is very difficult to cut; (d) *Bajir Lauha*—it is of sky colour and shows thin lines; (e) *Tarabatta*—not described; (f) *Kala* or *Kalayasa*—blue-black colour, brilliant, plain, heavy and does not break even by striking with an iron hammer. (3) Wrought iron *(Kantam)*; its characters:—"It possesses one, two, three, four or five faces and often many more faces (with which to attract iron) and is of yellow, black and red colour respectively. It is also subdivided into five varieties:—(a) *Bhramaka*—"that variety which makes all kinds of iron move about"; (b) *Chumbaka*—"that which kisses any other piece of iron"; (c) *Karshaka*—"that which attracts another piece of iron"; (d) *Dravaka*—"that which can at once melt other sorts of iron", and (e) *Romakanta*—"that which when broken, shoots forth hair-like filaments". Of all varieties described above *Bhramaka* and *Chumbaka* are well suited in curing diseases; *Karshaka* and *Dravaka* in *Rasayana* for rebuilding of the lost tissues of the system. *Romakanta* is best suited in binding or treating mercury. "Mercury is like an intoxicated elephant and *Kantam* is like the bent hook wherewith to restrain it. The wise man digs it out of the mines. That which has remained exposed to the sun and the atmosphere is to be avoided".—(Rasarnava). "If water is kept in a vessel and oil poured over it and the oil does not spread about; if asafoetida gives up its odour, and decoction of Melia azadirachta *(neem)* its bitterness, and milk being boiled in it, does not overthrow

but rises high like a peak—if such be the characteristics of the vessel, know that it is made of Kanta iron *(Kanta Lauha)*.—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 109). *Kanta Lauha* is recommended for use in preparation of medicines.

Purification.—Iron is purified by the following methods:—(1) It is first of all beaten into thin plates, which are then heated in fire and when red-hot, plunged into the following liquids one at a time:—oil, whey, conjee, cow's urine and a decoction of Dolichos uniflorus. This is repeated three times in succession. (2) To get rid of impurities, boil one and half seer of water, reducing to quarter and then soaking in it half a seer of thin plates of cast iron which have been previously heated. Repeat the process seven times. (3) "Powdered iron is to be macerated a while in the decoction of *the three myrobalans, (triphala)*, in cow's urine and then to be mixed up with clarified butter and fried in an earthen vessel and stirred with an iron rod until a blade of straw thrown over it catches fire. The iron powder is to be pounded and the above process repeated five times. Or, iron is roasted four times in a covered crucible with the decoction of the myrobalans and is reduced to fine powder. Leaves of *Tikshna* iron (steel or cast-iron) are repeatedly to be heated and plunged into water and then to be powdered in a stone mortar with an iron pestle...The powder of iron thus obtained is to be roasted twenty times in a covered crucible in combination with mercury and sulphur, and after each roasting the powder of iron is to be pounded as directed above—iron thus reduced to ashes is to be used in medicine.

Take one part of iron and twentieth part of its weight of cinnabar and rub them with lemon juice and sour gruel and roast the mixture in a covered crucible. The operation being repeated 40 times, *Kantam, tikshnam* and *mundam* are killed.

Take of mercury 1 part, sulphur 2 parts and iron-powder 3 parts and rub them with the juice of Indian aloe and after 6 hours transfer the mass to a brass-vessel and cover it with the leaves of the castor-oil plant. At the end of an hour and a half the mass will become heated. It is then buried under

a heap of paddy grains and taken out after three days and then powdered very fine and the contents passed through linen. All the three varieties of iron are thus completely killed.—(Sir P. C. Ray's H. of H. Ch., Vol. I, pp. 109-110).

Tests for Killed Iron.—"Killed iron is that which in the shape of impalpable powder floats on water and when rubbed between the thumb and the fore-finger enters the lines; which on being mixed with treacle, Abrus precatorius, honey and ghee, and heated, does not revert to the natural state; which floats on water and does not sink down even when heavy things like paddy grains are placed over it.

Killed iron is that which on being heated with silver does not mix (or alloy) with it.—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 119).

Characters of Prepared Iron (Oxides of Iron).—It is a fine impalpable powder of a dark reddish brown colour which floats on water.

Preparation of Lauha Bhasma.—The most easy method of reduction of iron is by soaking it for seven successive days in the juice of pomegranate or Jam leaves and drying it in the sun. Then the iron is roasted (by *putas*) as usual. By this method only 6 to 10 *putas* are sufficient for efficient reduction of iron:—Dose is 6 to 12 grains.

Action.—Iron improves the quality of blood. Iron produces constipation and this is why it was recommended to be administered with *Triphala* powder. Iron stimulates the functional activity of all the organs of the body and is therefore a valuable general tonic. *Lauha Bhasma* is a powerful alterative, astringent, tonic and restorative.

Uses.—Iron and its preparations are generally given with certain selected vehicles. In consumption it is given with black pepper and long pepper. In hectic fever *Lauha Bhasma* is given with honey and dry ginger. In gonorrhoea it is given with *guggula*. As a haematinic tonic prepared iron is used in many diseases:—Anaemia and chlorosis:—Iron is of great value in both simple and secondary anaemias. The benefit is

specially marked in cases of chlorosis and in anaemia caused by malaria, kala-azar, chronic discharges or repeated passive haemorrhage. Among the various preparations *Navayasa Lauha* is very useful and is very commonly used in all forms of anaemia; it is prepared thus:—Take of prepared iron 9 parts, ginger, long pepper, black pepper, tuber of Cyperus rotundus, Plumbago root, each 1 part; powder and mix. Dose in 4 grains with honey. The dose is increased gradually every second day by 2 grains till the maximum dose of 16 grains is reached—(Chakradatta). *Guduchyadi Lauha* is a similar preparation with the only difference that it contains also *Gulancha*. *Lohasava* is another similar preparation containing, besides the above drugs, *triphala, ajwan* and *vavading.* It is useful in anaemic dropsy and diseases of the spleen. Dose is ½ to 2 tolas. In secondary anaemia from chronic intermittent fever, iron is very useful adjuvant to anti-pyretic drugs. *Vrihat Sarva-Jvara-hara-Lauha, Visama Jwarantaka-Lauha* and *Jaya Mangala Rasa* are well known preparations containing iron and are commonly used. In haemorrhagic diseases such as haemoptysis, haematuria, bleeding from piles, etc., iron is commonly given with good results. In leucorrhoea leading to anaemia, preparations containing iron are useful. Iron is a valuable remedy in Bright's disease and not only cures the anaemia but also lessens the albumin. It is usually prescribed with *Yavakshara,* for which *Tryushanadi Lauha* recommended in Rasendrasara Sangraha is used. It contains:—Iron 4 parts, *Yavakshara,* ginger, long pepper & black pepper each 1 part, made into 6 grain pills with water. It is useful also in chronic dyspepsia with anaemia, scrofula and tuberculosis and in anaemia due to intestinal worms. Iron is of great value when given internally in some skin diseases, *i.e.,* erysipelas, carbuncles and farunculosis. The use of iron with vegetables containing tannic acid, produces tannate of iron which is insoluble in water and it is a very strong illustration of chemical incompatibility. But, Dr. H. C. Sen says "recent investigations have shown that iron in its mineral state is not absorbed. The only way in which it enters the system is as vegetable or mineral compound. Large quantities of iron do produce effect on anaemia. This is due to the power of iron

to educate the cells to take iron from vegetables and animals. Iron is not absorbed in any other way. We have about 46 grains of iron in our system. If it were not for this fact, and 3 doses of ferri carbonas saccharatus ought to have cured every case of anaemia. We know, however, that this is far from being true. The iron goes out with the faecal matter as sulphide. The gradual effect of iron in anaemia is due to its teaching the intestinal and other cells to do their duty of selection more carefully. What is true of iron, is true of many other things." A light diet of fine rice etc., should be adopted, and all indigestible food should be avoided during the use of this medicine. A preparation called *Chandanadya Lauha* is recommended in Rasendrasarasangraha for all sorts of chronic intermittent fevers and fever with enlarged spleen; it contains iron, together with a number of vegetable drugs, all rubbed together. Dose is ten grains to be taken with the fresh juice of Tinospora cordifolia and Hedyotis biflora. *Rasayanamrita Leha* is a confection containing prepared iron and a number of vegetable medicines and rock salt prepared with the aid of lemon juice, decoction of the myrobalans, sugar and ghee is useful in enlargement of abdominal viscera, anaemia, jaundice and chronic fever. Dose is 1 to 2 tolas. *Visamajvarantaka Lauha* is also useful in such cases. It is prepared out of sublimed mercury and sulphur, prepared gold, prepared iron, copper and talc, prepared tin, red ochre and corala, roasted pearls, conchshell and bivalve shell, and beaten together into a mass with the aid of water, and the mass then enclosed within bivalve shells covered with a layer of clay and roasted lightly in fire burning with cowdung cakes. Dose of this is four grains given with the addition of long pepper, rock salt and asafoetida each 4 grains and a little honey, daily in the morning. Several preparations of iron are used in piles such as *Mana Suranadya Lauha, Arsari Lauha, Agnimukha Lauha etc.* ..*Mana Suranadya Lauha* is prepared thus:—Take of the root-stocks of Colocasia indica and Amorphophallus campanulatus, of the roots of Ipomoea turpethum and Baliosperum montanum, marking nuts, *the three myrobalans (triphala)*, black pepper, long pepper, ginger, seeds of Embelia ribes, root of Plumbago zeylanica and the tubers of Cyperus rotundus, equal parts, pre-

pared iron in quantity equal to all the above ingredients. Powder and mix. Dose is about a scruple. This medicine is useful in piles with constipation. For haemorrhagic diseases *Kandakadya lauha, Sudhanidhi rasa, Amalakadya lauha,* etc., are recommended. The last is prepared thus:—Take of emeblic myrobalan and long pepper each 1 part, sugar 2 parts, prepared iron 4 parts, powder and mix them together. Dose is 6 to 12 grains in haemoptysis, haematuria etc., with suitable adjuncts—(Rasendrasarasangraha). In anaemia and dyspepsia with anorexia an organic compound of iron called *Kalpam* made of iron powder, pepper, garlic and limes, was tried and "found very beneficial in improving the blood, strengthening the patient and also in creating an appetite"—(Ind. Drugs Report, Madras). In dropsy due to anaemia, Bright's disease and heart affections, *Shoathahar Loha* the chief ingredients of which are *trikatu, Yavakshara* and *Loha bhasma* (Calcined iron) is recommended in doses of 1 to 4 pills of 6 grains each three times a day after food. For chronic dyspepsia giving pain after digestion, and for chronic fever, diarrhoea, phthisis etc., Bhavaprakasha gives a *confection* containing *vavading, mustaka, triphala, trikatu, gulancha, danti, trivrit chitraka,* prepared iron, old iron rust, prepared talc, purified mercury and sulphur. Dose is 10 to 30 grains with milk or cold water. For anaemia, jaundice and dyspepsia a preparation called *Dhatri leha* made of prepared iron 32 tolas, emeblic myrobalan 64 tolas and liquorice root 16 tolas, all powdered and soaked into *Gulancha* root-juice seven times successively is used. Dose is 20 to 40 grains. In asthma with constipation due to *Vayu-pitta,* iron is used in the form of *Mahasvasari lauha* and *Pippuladi lauha* which are similar in composition *viz:*—prepared iron, prepared talc, *triphala,* liquorice root, raisins, long pepper, kernel of jujube fruits, bamboo-manna, *talispatra, baberang* seeds, cardamoms, root of Aplotaxis auriculata, flowers of Mesua ferrea, honey and sugar. Dose is 20 grains taken with honey two or three times a day. In enlarged spleen *Rohitaka lauha* is the favourite form in which iron is used. In enlarged liver, spleen, jaudice etc. *Yakridari lauha* mentioned in Rasendrasarasangraha is used; it is made of prepared iron, talc

and copper 4 tolas each, root of Citrus Bergamia and burnt deer-skin 8 tolas each, rubbed together with water to make a pill-mass. Dose is 9 to 18 grains. In anasarca it recommends *Tryushanadi lauha* already mentioned in connection with Bright's disease. It gives also a number of iron preparations for various kinds of diseases; *e.g.,* erysipelas, carbuncles and boils, a pill called *Kalagnirudra rasa* is recommended. It contains mercury, sulphur, prepared talc, iron, iron rust and iron pyrites each 1 part rubbed together with water and the mixture roasted within a covered crucible, and when cool, one-tenth part of its weight of aconite is added, mixed intimately and the mass divided into 22 grain pills. For chronic fever, anaemia, jaudice etc., and urinary diseases as gonorrhoea, strangury etc., a preparation called *Mehamudgara rasa* is recommended. It contains prepared iron, black salt, *triphala, trikatu* and a number of other vegetable substances, beaten into a uniform mass with ghee. Dose is 22 grains with water or goat's milk. In diabetes and other urinary diseases, female complaints etc., pills called *Vrihat Somanatha rasa* are recommended to be administered with honey. It contains prepared iron, talc, tin, silver, calamine, iron pyrites, sublimed and purified mercury and gold. Dose is 4 grains. For diabetes, late Hakeem Ajmal Khan Saheb of Delhi prescribed 1 grain of reduced emerald and ½ grain of reduced iron, mixed and made into one dose to be used with a *Majoon* (confection) suited to the disease—(Hakeem & Vaidyan). A preparation similar in composition to the above and called *Somesvara rasa* is given in leucorrhoea and other female complaints. In "worm affecting the liver and causing jaundice and in blood parasites with constipation and ulceration in eye and throat" a preparation called *Krimi-kalanal Rasa,* containing iron mercury and sulphur, lead, aconite, and *Vidanga,* is recommended and for "blood parasite causing jaundice or dysentery, another preparation named *Krimirogari Rasa* containing iron, mercury and sulphur, lead, aconite, Cyperus rotundus, *triphala, trikatu,* Cissempelos pareira, Pavonia odorata, Aegle marmelos, Woodfordia floribunda and juice of Verbesina calendulaceae, is recommended—(Dr. Ashutosh Roy—Jour. of Ayur., Oct. 1925). Another haematinic vermifuge mentioned by the same and

called, *Vidanga Lauha* containing *vidanga,* iron, mercury and sulphur, arsenic, black pepper, nutmeg, cloves, ginger and borax is good in worms and blood parasites with chronic fever and other troubles of gastro-intestinal tract.

Besides the preparations mentioned above numerous other combinations of mercury, iron and talc with the addition of gold, silver, copper etc., in varying proportions and combinations are described under different names. In fact, mercury, iron and talc constitute the basis of the great majority of the pills used by *Kavirajas.* Iron forms an ingredient of hair dyes, *e.g.*—a *paste* made of powdered iron, chebulic and emeblic myrobalans 2 tolas each, mango stones 5 tolas and belleric myrobalan 1 tola rubbed together with water in an iron vessel and steeped for one night. This paste is applied to grey hairs for turning them into black—(Bhavaprakasha).

---

## 25. FERROSO-FERRIC OXIDE

Ferri Oxidum Praecipitatum Fuscum (B.P.C.) or Ferri Peroxidum Rubrum (*Sans.*—Manduram. *Eng.*—Ironrust; impure oxide of iron; Magnetic iron oxide; Magnetite. *Arab.*—Khabsul Hadid. *Pers.*—Zang-e-ahana. *Bom.*—Loheka janga. *Hind.*—Lohaka-Zang. *Ben.*—Lohar-gu. *Duk.*—Lohaka-gu; Mandur. *Guj.*—Lodhano-kata. *Tel.*—Innupa chittumu. *Tam.*—Irumboo Chittam. *Mal.*—Irambak kitane. *Can.*—Kabbinada Kilubu or kitta. *Sinh.*—Yakada kittam. *Kon.*—Lokhanda-gu. *Burm.*—Sanpia; Tambia) is prepared iron rust consisting of small particles of iron or forge scales scattered round the blacksmith's anvil, when hot iron is beaten on it; these by exposure to air become rusty and brittle; then they are considered fit for use. They are then roasted again and powdered very finely. *Mandura* is thus purified and prepared for use like cast iron. The properties of *Mandura* are similar to those of cast iron. "The qualities which reside in killed iron are also to be found in the rust of iron; hence the latter may be substituted for the treatment of diseases"—(Rasaratna Samucchaya). Dose is 2 to 6 grains. *Mandura* is specially useful in anaemia, amenorrhoea, dysmenorrhoea, menorrhagia,

chlorosis etc.; also diarrhoea, chronic bowel complaints, dyspepsia, intestinal worms and nervous diseases; neuralgia of the 5th nerve due to debility, kidney diseases, albuminuria etc. *The most important conditions under which the use of Mandura should be avoided are feverishness produced either by chronic diseases or by local irritation as in dyspepsia attended with constipation.* *Guda Mandura* is a favourite medicine for dyspepsia with pain after taking food. It is made thus:—Take of iron rust 3 parts, emeblic and chebulic myrobalans, and old treacle each 1 part. These are rubbed together with honey and ghee and made into boluses; to be taken in divided doses before, along with, and after meals—(Bhavaprakash). *Mandura Loha,* the chief ingredients of which are *trikatu, chitraka, vidanga, makshika bhasma* and *mandura bhasma* is used in asthma, general debility, sexual debility, intermittent fever with enlargement of spleen and heart disease. Dose is 1 to 4 pills of two grains each twice a day after food. For dyspepsia, congested liver etc., a powder composed of *Mandura* and *panchalavana* (the five salts) 5 parts each and *Amla* 4 parts is useful. Dose is 10 grains. To women with scanty menstruation *Mandura* is given in combination with aloes and other stimulants. Following are a few useful Home Remedies containing *Mandura.*—(1) Take of *Mandura* 4 parts, Oxalis corniculata, Piper longum, each 1 part, and sugar 2 parts. Mix and powder. Dose is 10 grains; used in haemoptysis and haematuria. (2) Take of *Mandura* 5, Cinnabar 1, *Trikatu* 5, Cloves 2, Arillus of nutmeg 3 parts. Mix and powder. Dose is 5 grains; used as an alterative tonic in the pregnant state. (3) Take of *Mandura* 4, Impure carbonate of potash 3, and *Trikatu* 1 part. Dose is 3 grains; used in anasarca. Externally an oil made of sweet oil 4 parts, *Mandura, triphala* and Indian sarsaparilla 1 part each and the juice of *Bhangra* 15 parts is used with much benefit in alopaecia.

---

## 26. FERRI SULPHAS

(*Sans.*—Kasisa; Hura-tutia. *Eng.*—Green Vitriol; Green Copperas; Copperas of Commerce; Sulphates of Iron (FeSo); Crude Ferrous Sulphate; Iron Sulphate; Salt of Steel. *Fr.*—

Sulphate ferreux. *Ger.*—Schwefelsaures Eisenoxydul. *Ben.*—Hira-kas; Hirakosis. *Can. & Kon.*—Hirakasa. *Arab.*—Zaje-Asfara. *Pers.*—Zankurmadni; Tutiya-saba. *Hind.*—Haratutia; Kasis; Hira-kasis or Heera-Kasus; Kahi. *Guj.*—Hara-kasis; Kashis. *Punj. & Kash.*—Sang-i-sabz. *Can. Tam. Tel. & Mal.*—Annabedi. *Malay.*—Madukalpa. *Tel.*—Tagramu) was divided into two varieties by the ancient Hindu chemists:—(1) *Valuka-kasisa* or *Dhatu-kasisa*, the green variety (ferrous sulphate); (2) Pushpa-kasisa, the yellowish variety which is probably iron sulphate covered with the basic sulphate of the sesquioxide from absorption of oxygen.—(Rasaratnasamuchchaya). "Copperas of commerce, is produced principally from the so-called alum shales from which alum is prepared. As is the case also with alum, copperas is found sometimes as a natural exudation upon alum shales and other rocks which include iron pyrites".—(Sir P. C. Ray in H. of H.Ch. Vol. I, p. 150). It is a salt usually obtained by the decomposition of iron-pyrites by the action of atmospheric moisture. It can be obtained also by dissolving iron wires in sulphuric acid by the aid of heat. It occurs in pale bluish-green oblique rhombic prisms. Crude, greenish-blue crystals of sulphate of iron are available in all the bazaars in India. Its taste is very astringent or styptic and without any odour; acid reaction; soluble in water, insoluble in alcohol. It is a valuable haematinic, tonic and astringent. It is apt to irritate the stomach. Preparations made of it are generally *Bhasma*, oil and solution. *Bhasma* is prepared by taking equal quantities of iron-sulphate and sulphur, reducing them to fine powder, mixing and roasting the mixture or mass. To this is added *triphala* (the three myrobalans), black pepper, honey and ghee and the whole is triturated. Dose is ¼ to 2 grains twice a day with honey and milk along with *triphala* powder and pepper. The *Bhasma* is alterative and diuretic and is given in ozoena, consumption, enlargement of the liver etc. According to Ayurvedic works it is rarely used internally. Only Chakradatta had recommended a *linctus* composed of iron sulphate and pulp of wood in hiccup. Iron sulphate, on account of its astringent properties, is used as a *lotion* in erysipelas, anaemia and constitutional debility, following on malaria, Kala-azar, etc., the following pre-

scription has been found useful:—Ferri sulphas 4 grains, omem water 6 ounces and infusion of chiretta 6 ounces. Two ounces of the mixture is given twice or thrice daily. Iron sulphate is, however, useful in all diseases, where iron is indicated. Following remedies are valuable in anaemia and debility:—
(1) A grain of ferri sulphas in an ounce each of omum water and infusion of chiretta thrice a day after food. This is useful in larger doses in cases of neuralgic or rheumatic attacks recurring periodically among the weak and the anaemic. (2) Twenty-four grains of ferri sulphas and thirty grains each of black pepper and cinnamon powder, made into 12 pills with a sufficient quantity of honey and given in doses of one pill twice a day. For anaemic females suffering from chorea etc., leucorrhoea and amenorrhoea purified aloes in equal quantity to iron sulphate may be advantageously added. *Though iron is useful in simple anaemias, it is useless or even harmful in pernicious anaemia.* The diagnosis between the two forms is made by a microscopical examination of the blood. *Externally* iron sulphate is used in skin diseases either alone or with other medicines. For painful syphilitic ulcers, Ferri sulphas is dusted over them after washing them. Its stick or solution is applied to foul ulcers and various skin diseases as eczema, prurites, intertrigo etc. Chakradatta prescribes for the above complaints, a *paste* made of equal parts of iron sulphate, gorochana, barberry root and orpiment, beaten into a paste with *Kanjika.* In spreading erysipelas a solution made of 10 grains of iron sulphate in an ounce of spirit of wine is applied with a camel hair brush over the reddened area of the skin and allowed to dry on; the application is repeated once a day only until the redness disappears. The part should be covered with cotton wool to exclude air. Chakradatta and Sharangadhara both recommend an oil called *Kasisadya taila,* as an application to the genitals and the breasts with the view of strengthening them. It is applied also in fistula-in-ano for the burning and pain in piles, and in ozœna, with benefit. It is made of 16 tolas each of iron sulphate, Withania somnifera root, bark of Symplocos racemosa and roots of Pothos officinalis, beaten into a paste and it is boiled with 4 seers of sesamum oil and 16 seers of water in the usual way. In bleeding

piles and prolapsus of the rectum, daily enemas of the simple solution of the sulphate (3 grains to an ounce of water) are serviceable. In chronic skin diseases an ointment made of iron pyrites and ghee is used with benefit.

---

## 27. FERRI SULPHURATUM (Fe S)

(*Sans.*—Svarnamakshika; Makshikam; Taramakshika. *Eng.*—Iron pyrites. *Hind. & Bom.*—Sonamukhi. *Guj.*—Sonamukhina-gantha) is formed by a combination of iron with sulphur; it is met with in many parts of India and has been used in Hindu medicine from a very remote period. "Iron pyrites ($Fe\ S_2$) are brass-yellow in colour and their dimorphous form marcasite is pale bronze-yellow; but there are other pyrite-like minerals which are silvery white; for instance, Cobaltite ($CoS_2.Co.As_2$), Smaltite ($CoAs_2$), Lollingite ($FeAs_2$ with ,S) and Leucopyrite ($Fe_3As_4$). Iron pyrites roasted in air would give a red residue of $Fe_2O_3$. But it seems more likely that the "golden-yellow" variety is copper pyrite, which has a deep yellow-colour and besides which iron-pyrite when freshly fractured would appear almost silver in colour. In that case the 'essence of the appearance of copper' might be the metal itself. ('*Vimala*' would appear also to be a variety of pyrites)". (Sir P. C. Ray's H. of H. Ch., Vol. I, p. 138).

Iron pyrites occur in two forms, viz: in dark-yellow nodules or granules with a golden metallic lustre (brass-yellow colour) and in silvery radiated crystals. The former, a native of Kanauj, is called *Svarnamaksika* and the latter *Taramakshika* is associated with stones and is of inferior quality. Chemically, iron pyrites consist of bisuphide of iron. Sulphide of iron is contained in preparations like *Lauha-parpati, Siddha-Jogeshwar* and other tantric medicines along with the sulphide of mercury and other vegetable substances. It is thus prepared:—Take 2 parts each of mercury, and sulphur and 1 part of killed iron, rub well together in an iron ladle and melt this powder with clarified butter over a gentle

fire. It is then poured over plantain leaves and gently pressed and finally used with other vegetable substances. Iron pyrites is purified by being boiled in lemon juice with one-third of its weight of rock salt in an iron vessel till the pot turns red hot. It is reduced to powder by being rubbed with oil or goat's urine and then roasted in a closed crucible. Iron pyrites thus prepared has a sweetish bitter taste. It is tonic, alterative and useful in anaemia, leucorrhoea, urinary diseases, ascites, anasarca, prurigo, eye-diseases etc. Dose is 2 to 6 grains with honey. As an alterative tonic it is generally used in combination with other medicines of its class, such as iron, talc, mercury etc. It is contained in a preparation known as *Garbha Vinoda Rasa.* Chakradatta recommends a preparation containing iron pyrites 5 parts, prepared iron, sesamum seeds, long pepper, black pepper and ginger 1 part each, beaten into a mass with sufficient quantity of honey, to be given in doses of ½ to 1 drachm in advanced anaemia and chlorosis; it is also useful in ascites and anasarca. As an alterative tonic useful in diseases of pregnancy a compound pill called *Garbha Kalana Rasa* is given in Rasendrasarasangraha; it contains iron pyrites and cinnabar 4 tolas each, ginger, long pepper and black pepper 3 tolas each, cloves and mace 6 tolas each beaten into a pill-mass with water, and divided into pills of 4 grains each. Dose is one pill twice a day. Another compound pill containing prepared iron-pyrites *(Makshika bhasma), Vavading* and *Atis* each 1 part and *guggula* equal in weight to all the other ingredients, made into a pill-mass and divided into pills of two grains each, is used in doses of 1 to 2 pills with milk and *conjee* in cases of rheumatism, gonorrhoea, heart disease, lumbago, hysteria etc. An *ointment* made of iron pyrites, iron sulphate and copper sulphate, in butter or ghee is a useful application in pityriasis, syphilitic sores and ulcers.

---

## 28. HYDRARGYRUM

(See also "Makaradhwaja" under Aurum).

*Sans.*—Parada; Rasa. *Eng.*—Mercury; Quicksilver. *Fr.*—Mercure. *Ger.*—Merkur. *Arab.*—Abuk; Zibakh. *Pers.*—

Simab; Zeebaq. *Hind. Ben. Duk. & Mah.*—Para. *Guj.*—Paro. *Mal.*—Rassam. *Tel.*—Padarasam. *Tam. Kon. & Can.*—Padrasa. *Sinh.*—Rasadiya.

*Para* means that which protects mankind from all sorts of diseases.

Source.—Mercury is sometimes met with free in Nature in the form of small, shining, silvery globules when it is called quicksilver; it is so found in small quantities. But it is mostly found as sulphide or native Cinnabar. It is scattered through different kinds of stones, clay or ores.

Characters.—It is a shining, silver-white metal liquid at ordinary temperature, divisible into spherical globules, mobile, without any odour or taste, slowly volatilizing at ordinary temperature; insoluble in water, hydrochloric acid, or cold sulphuric acid, but soluble in nitric acid and *hot* sulphuric acid. It readily volatilizes at a temperature of red heat without any residue. Mercury as found in the market contains impurities such as tin, lead, stone etc. If administered in an impure state it brings a number of diseases; hence it is purified before use.

Impurities.—There are 3 natural impurities in quicksilver: *Visha* (poison), *Vanhi* (fire), and *Mala* (dirt, dregs) and two artificial, due to its being alloyed with lead and tin. (Tradespeople fraudulently adulterate quicksilver with lead and tin, hence it is to be freed from these artificial defects (impurities) by means of 3 distillations by the use of *Tiryakpatana Yantram)*.—(Sir P. C. Ray).

Purification.—Various processes for purifying mercury are described in books. At the present day the following is generally adopted by Kavirajas. Mercury is first rubbed with brick-dust and garlic, then tied in four-folds of cloth and boiled in water over a gentle fire for three hours in an apparatus called *Dola yantra.* When cool, it is washed in cold water and tried in the sun. Some practitioners use betel-leaves instead of garlic for rubbing the mercury with. Mercury obtained by sublimation of cinnabar is considered pure and preferred for internal use. Cinnabar, i.e., red sulphide

of mercury, occurring in nature as a mineral ore, in many parts of the world, particularly in California, China and Spain, is first rubbed with lemon juice for three hours, and then sublimed in the apparatus called *Urddhapatana yantra.* The mercury is deposited within the upper pot of the apparatus, as a blackish powder. This is scraped, rubbed with lemon-juice and boiled in water, when it is fit for use. "In order to examine whether the mercury has been completely reduced to ashes, it has to be heated over a gentle fire for 3 hours. If the weight remains constant, know then that it has been completely killed".—(Rasaratnakara). In other words, it means that if there be any free mercury present, it would volatilise off and thus there would be a loss in weight".—(Sir P. C. Ray in H. of H. Ch., Vol. I, p. 247). A peculiar form of mercury called *Shadguna balijarita rasa* is thus prepared:—A little sulphur is placed in an earthen pot, and over it some mercury. The pot is heated in a sand-bath, and, as the sulphur begins to melt, cautiously and gradually more of it is added to or placed over the mercury, altogether to the extent of six times the weight of the mercury. When the whole is melted like oil, the pot should be quickly removed from the fire, and cooled till the mass is consolidated. It should then be broken, and the mercury extracted from within the mass. Mercury thus obtained is superior to all other forms, but it is not much used at present.

Fixation of Mercury:—*Rasavandha:* processes for destroying the fluidity of mercury:

(1) Take mercury and one-fourth its weight of *killed* gold and with the addition of sulphur make a ball. Now add an equal weight of sulphur and roast the mass in a covered crucible or a glass retort. The mercury thus treated is afterwards killed with six times its weight of sulphur, and a shining reddish-brown crystalline sublimate of sulphide of mercury is thus obtained. This is '*Makaradhwaja*'.—(Sir P. C. Ray in H. of H. Ch., Vol. I, p. 132).

Various methods of Incineration of Mercury:—

(1) Mercury, roasted in a covered crucible with asafoetida, which has been previously digested in the milky juice

of Ficus oppositifolia, is reduced to ashes.

(2) Andropogon serratus and Clitorea ternatea are to be pounded in a mortar with sour gruel and with the paste thus formed, mercury is to be triturated and digested 7 times and finally roasted in a covered crucible after addition of fresh quantities of the above paste. The mercury is reduced to ashes, resembling salt.

(3) The seeds of Achyranthes aspera and Ricinus communis are to be pounded together. The mercury is to be placed inside the powder and the mass roasted as before. The mercury is reduced to ashes.—(Rasendrachintamani).

Purified mercury is to be preserved in the hollow of a horn or tooth or of bamboo.

Rasendrachintamani enumerates "the substances which *kill* mercury without the use of sulphur", i.e., 41 plants, out of which any ten may be employed at a time for the roasting operation. The following among others occur in the list of those 41 plants:—Vitis quadrangularis; Andropogon serratus; Plumbago zeylanica; Clitorea ternatea; Calatropis gigantea (milky juice); Euphorbia neriifolia (milky juice); Vitex negundo; Datura stromonium; Achyranthes aspera; Ficus oppositifolia and Tinospora cordifolia.—(Sir P. C. Ray's H. of H. Ch., Vol. I, pp. 132-133).

Preparations.—Four kinds of the ash (*bhasma)* of mercury are described in ancient books, viz: black, white, yellow and red (vermilion) called respectively *Krishna, Sveta, Pita* and *Rakta bhasmas. Krishna bhasma (kajjali)* is the black sulphide of mercury made by rubbing together and dissolving over the fire three parts of mercury with one of sulphur. This black sulphide of mercury is known as *Rasaparpati.* The *sveta bhasma* (white ash) is the *Rasakarpura* or camphor of mercury. This is often found to be almost pure calomel and sometimes a mixture in indefinite proportions of calomel and corrosive sublimate. Several processes are given in Sanskrit works for preparing it:—

1st method:—Take of mercury and chalk equal parts, and rub them together till the globules disappear. Rub this mix-

ture of chalk and mercury with *pānsu* (salt obtained from saline earth) and the juice of Euphorbia neriifolia repeatedly. Enclose in a covered crucible and heat it within a pot full of rock salt. The perchloride of mercury will be deposited in the shape of a pure white powder under the lid of the crucible. —(Rasendrasarasangraha). But this is now-a-days prepared by subliming the black sulphide of mercury with common salt or rock salt.

1st method in other words:—"Rub mercury repeatedly with *pānsu* salt (i.e., Audbhida salt) and the juice of Euphorbia neriifolia; place the mixture inside an iron bottle, the mouth of which is closed with a piece of chalk. The bottle is embedded in a mass of salt, and then fire is urged for an entire day. The white deposit in the neck of the bottle is to be collected".—(Rasendrasarasangraha).

2nd Method:—Take a strong earthen pot and fill one-fourth of it with common salt and place over it a mixture of brick-dust, alum and rock-salt. Rub mercury with the juice of Indian aloe and an equal weight of the above mixture into a paste; deposit it in the earthen pot and cover it with the same ingredients. The pot is to be firmly closed with a well-fitting lid. Now apply heat for three days together.—(Rasendrachintamani).

*N.B.*:—Dutt writes:—"*Rasakarpura* is now prepared, not according to the processes described in Sanskrit works, but by subliming the black sulphide of mercury with common or rock salt. In this form it is largely manufactured and sold in all the bazars".

The yellow preparation called *Pita bhasma* is prepared as follows:—Take of mercury and sulphur equal parts, rub them together for seven days with the juice of Phyllanthus neruri and Heliotropium indicum. Place the mixture in a covered crucible, and heat it in a sand-bath for 12 hours. The result will be a yellow compound. The red preparation called *Rakta bhasma* or *Rasasindura* is prepared in a variety of ways. The following is one of them:—Take of mercury and sulphur equal parts, rub together with the juice of the red buds of Ficus

Bengalensis for three days successively, introduce the mixture within a bottle and heat it in a sand-bath for 12 hours. A red deposit will adhere below the neck of the bottle. It is taken out in the shape of dark-red shining scales. The black sulphide prepared by rubbing together equal parts of sulphur and mercury till the globules disappear is called *Kajjali.* The red sulphide of mercury is called *Hingula (Eng.*—Cinnabar (HgS) (Specific gravity 8); or Vermilion; *Arab. Pers. Hind. & Bom.*—Sinjraph; *Guj.*—Hingalo; *Mah. Can. & Kon.*—Inglika); this sulphide occurs in nature as a fine grained, dark-red, very heavy mineral ore of mercury called *cinnabar* in many parts of the world; it is found in Nepal. *'Hingool'* found in the Calcutta market is not the natural ore, but is artificially prepared by heating mercury with sulphur in a retort. This substance, except for the slight impurities which it may contain, has the same composition as *'Makaradhwaja'.* In the Ayurvedic practice, however, *'hingool'* and *'Makaradhwaja'* are claimed to possess entirely different properties. Not only is it considered different from 'hingool' (the natural red sulphide of mercury), but it is also thought to be different from the artificial sulphides of mercury like *'Kajjali'* and *'Krishnaparpati'* (both of which resemble black sulphide of mercury in composition) and *'rasa-sindhura'* (red sulphide of of mercury). These differences are rather difficult to explain from the modern scientific point of view.—(Chopra). These four preparations, viz: Cinnabar or *Hingula, Kajjali,* the red preparation called *Rasasindura* and the *Rasakarpura* of the bazaar are the four principal forms in which mercury is used in Hindu Medicine; that is, they constitute the basis of all the formulae containing mercury. *Hingul bhasma* or red sulphide ash is prepared by taking red sulphide 4, orpiment 1 and cloves 4 parts, and making a bolus in the juice of fresh ginger, and roasting it in a covered crucible over a fire and reducing the whole to ashes. Dose is 1/3rd to ½ grain.

Action.—Most of the soluble salts of mercury are absorbed slowly from the intact mucous membrane of the alimentary tract and produce their systemic effects. The insoluble mercurial salts, however, are very sparingly absorbed. Mer-

curous chloride and mercurous iodide are known to be absorbed as mercury can be detected in the urine after their administration. It has been found that after administration of 0.6 gm. of calomel and 20 mgm. of mercurous iodide daily, 5 mgm. and 4 mgm. of mercury respectively are excreted in the urine. In the case of sulphides, however, a great deal of doubt exists as to whether they are absorbed at all. The sulphide ion is very inert and it is clear that unless and until the salt is dissociated into its constituent ions, mercury will not be able to exert its influence on the body tissues. Sulphide of mercury is not used in any of the Pharmacopoeias of Western countries as it is considered to be devoid of therapeutic activity. This idea gains additional support from the fact that the various mercurial salts after absorption are excreted into the caecum and colon as sulphides and in this form, mercury is found in the faeces. In the Ayurvedic Pharmacopoeia, on the other hand, mercury is predominantly used in the form of sulphides. It is indeed strange that a country, where this metal was first harnessed into the service of medicine, should have chosen an insoluble and possibly an inert salt for therapeutic uses. Investigation was, therefore, carried on to determine whether this salt is at all made soluble under ordinary physiological conditions in the gut and whether the mercury ion liberated from this so-called inert combination can be utilised by the tissues.—(Chopra). Small doses of mercury diminish the amount of oxidation of the tissues, as evidenced by the variations in the gaseous interchange. Further, administration of small doses of mercury to rabbits, dogs and men causes an increase in the number of red blood corpuscles while the body gains in weight and the general nutrition is improved. Larger doses, however, have been found to act in the reverse way by causing a diminution in the amount of haemoglobin, in the number of corpuscles and in the weight. Most of the preparations of mercury in use in the British Pharmacopoeia are rapidly absorbed so that larger quantities of mercury ion than are good for the system, are probably taken up.—(Chopra).—See *"Mākaradhwaja's"* action also. Mercury is known to be a powerful and readily diffusible protoplasmic poison which acts in very high dilutions against

lower forms of life. "Mercury, alloyed with 1/64th part of its weight of gold or silver acquires a mouth wherewith to swallow even hard metals".—(Sir P. C. Ray in H. of H. Ch., Vol. I, p. 120). Mercury is tonic, alterative, purgative, indirect cholagogue, antiphlogistic, antiseptic and sialagogue. When taken into the system it combines with the acids and fluids of the body; it is then easily absorbed by the skin, the mucuous membranes, lungs and stomach and passes into the blood as oxy-albuminate. In the stomach it is converted into double chloride of sodium and mercury. It unites with the albuminous juices and is easily absorbed. In the intestines only a small portion of it is absorbed; the rest being converted into a sulphide and eliminated with the fæces. In small doses it acts as a blood tonic. It increases the number of red corpuscles and thus, in syphilis it counteracts the effects of poison in the blood. In large doses it impoverishes the blood and lessens its coagulability and therefore *it should not be used in haemorrhagic diathesis and in cases of repeated attacks of menorrhagia;* it diminishes the red corpuscles, lessens oxygenation, promotes the waste of tissues and disorders nutrition and digestion. It stimulates the salivary, duodenal and the pancreatic glands and the bile ducts and thus increases the flow of bile. It also stimulates the liver cells and hence acts as an indirect cholagogue. It may be found in the blood, saliva, milk, urine, sweat, bile, pus, as also in various tissues of the body. In pregnant women mercury leads to abortion, still-births and births of cachectic infants; in children it leads to a low state of the body known as Marasmus, and in adults, to a kind of cachexia characterised by wasted muscles, pale skin and tendency to haemorrhages etc. Over-doses or long continued use of mercury produce a set of symptoms known as mercurialism characterised by symptoms of profuse salivation, swollen and spongy gums, foul breath, swelling of the tongue, ulceration of the mouth, lips and tongue, loosening of the teeth etc., etc. Mercury has the wonderful property of absorbing, as it were, the actions of the other drugs with which it is sublimed; *e.g.*—silver and copper when roasted with mercury and sulphur impart their antispasmodic and tonic properties to the red sulphide which sublimes. Lead when roast-

ed in a similar way with sulphur and mercury imparts its astringent property to the red sulphide of mercury. When sublimed with gold the red sulphide becomes a valuable tonic though red sulphide prepared without gold has quite different properties—(H. C. Sen). He says that insoluble preparations like Calomel are not necessarily inert; and says that the red sulphide and the black sulphide of mercury are extremely efficacious in liver complaints, such as commencing cirrhosis of the liver, dyspepsia, chronic dysentery and similar other allied diseases, such as chronic diarrhoea where the stools are deficient in bile. "I generally use these preparations in 5 to 15-grain doses twice a day. The most important precaution to be observed by the patients while using these preparations is that they have to give up salt and water altogether. The result is marvellous. In those cases of sloughing dysentery in whom these were administered in the very last stage, I have invariably noted golden yellow bile in the upper part of the intestines and in the gall bladder. It is well-established fact that natural bile secretion is essential in the treatment of dysentery and other bowel complaints, including even cholera". The sulphides produce "asepsis in the large intestine owing to their slow absorption, like salol and beta-naphthol, and to their stimulating the liver to secrete golden-yellow bile".

Uses.—"Mercury preparations have been used for many years as tonic and alterative in the Western medicine. 'The shining reddish brown crystalline sublimate of sulphide of mercury is a favourite and frequently used remedy with the Hindu physicians. It is reputed to be a panacea for a variety of ills that flesh is heir to. In the 'Rasendrachintamani', 'Rasendrasarasangraha' and other treatises, this preparation is described as 'Makaradhwaja' and 'Rasasindura' (lit. minium-like mercury). From the supposed presence of gold it is often named 'Svarnasindura' (lit. gold and vermilion). During sublimation, the gold of course is left behind. The general belief is that by association with gold the mercury acquires most potent efficacy. A later work 'Rasapradipa', is sceptical about the part which gold plays and recommends its being left out!"—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 132). In fevers of all descriptions mercury is used in combination with

aconite, croton seed, *datura* and other drugs: *e.g.*:—The preparation called *Hingulesvara* contains equal parts of Cinnabar, aconite and long pepper rubbed together and made into pills about four grains each. These are given beaten up with a little honey in ordinary remittent fever. In the *Vayu* type of remittent fever and that of typhoid fever, *Mrityunjaya Rasa* containing Cinnabar 2 parts and corrected aconite, sulphur, black pepper, long pepper and borax each 1 part, well powdered and rubbed into a paste with water for days together and divided into two-grain pills, is recommended—(Rasaratnakara). In fevers with constipation, another combination called *Jwaramurari Rasa* is recommended—(Bhaisajyaratnavali). It contains Cinnabar, aconite, *trikatu*, borax, chebulic myrobalan and corrected croton seeds, pulverised, well beaten and made into pills of 2 grains each administered generally with honey and ginger-juice. The pills called *Taruna Jvarari* contain equal parts of mercury, sulphur, aconite and croton seeds rubbed together with the juice of Aloe indica and made into four-grain pills. These act on the bowels and relieve fever. They are given with sugar and water—(Bhaisajyaratnavali). Pills called *Tribhuvan Keerti Rasa* of which the chief ingredients are *Rasasindura*, aconite, *trikatu* and *pippali moola* are used in high fevers and all local acute inflammations such as those of pneumonia, erysipelas and painful neuralgic affections. Dose is 2 to 6 pills of 1 grain each every two hours until fever subsides. In diarrhoea and dysentery of obstinate chronic form, mercury is used in a great variety of preparations, for example:—*Vajrakapata Rasa* is made of equal parts of mercury, sulphur, opium, *mocha-rasa*, *triphala*, *trikatu*, powdered, mixed and soaked in the fresh-prepared leaf-juices of Cannabis sativa and *Bhringaraja* seven times and made into pills of six grains each. These are administered with honey in obstinate chronic diarrhoea. Dose is from 1 to 3 pills three times a day. (2) *Anandabhairava Rasa* containing Cinnabar, aconite, black pepper, borax and long pepper in equal parts, mixed and reduced to a fine powder is given as a specific for chronic diarrhoea, dyspepsia, colic and diarrhoea of typhoid fever. Dose is 5 to 10 grains given with honey mixed with the decoction of the bark of

Holarrhena antidysenterica. It may be given mixed with lime juice or ginger juice in a pill-form also. *Gandhar Rasa* made up of equal parts of prepared mercury, sulphur, opium, H. antidysenterica, Aegle marmelos, *lodhra* bark, *Nagarmotha, mocharas* and *dhania* flowers, is also useful. Dose is 2 to 5 grains with whey. (3) *Panchamrita parpati* consists of mercury 4 tolas, sulphur 8 tolas, prepared iron 2 tolas, prepared talc 1 tola and prepared copper ½ tola, all rubbed together in a mortar and melted in an iron ladle and prepared into disks. Dose is 4 grains with honey and ghee, gradually increased to 16 or 18 grains—(Bhaishajyaratnavali). *Parpatis* of different sorts when given in cases of diarrhoea with anasarca are conjoined with a milk diet, and water and salt are prohibited. (4) *Mahagandha Rasa* made up of mercury and sulphur, nutmegs, mace, cloves and neem leaves each two tolas, powdered, mixed together and roasted in the usual way. It is administered in doses of about 4 grains in the acute diarrhoea of children—(Rasendrasarasangraha). H. C. Sen says that "the sulphides of mercury are direct cholagogues, and that they have no equal in chronic dysentery, even of the sloughing type. The precaution of stopping salt and water must be strictly carried out. "I have cured very obstinate cases of dysentery, cirrhosis of the liver with accumulation of fluid in the peritoneal cavity and obstinate cases of dyspepsia and chronic diarrhoea with these sulphides. Though these are far inferior to the soluble preparations of mercury, yet they are decidedly efficacious, and they have a peculiar advantage for they never produce mercurial poisoning....I have used other preparations of mercury like corrosive sublimates, calomel, grey powder, blue pill, etc., in dysentery with or without small doses of ipecacuanha. There are many men who use calomel in large doses for the treatment of cholera...I think half a grain or a quarter grain of calomel, or even less, often succeeds in giving suitable cases of cholera a favourable turn. The big doses of calomel produce salivation after convalescence. Everybody knows that at the evacuation stage of cholera hardly anything is absorbed from the gastro-intestinal tract. Whatever is done by the administration, say of 10 or 20 grains of calomel, is achieved by a very small quantity which

actually reaches the liver. The rest of the calomel if not thrown out with the faecal matter, is sure to produce salivation. Very minute doses of calomel give a favourable turn to cholera by checking vomiting and bringing on secretion of bile and of other digestive fluids. The unutilised part of the big dose of calomel is absorbed in the convalescent stage, and makes the poor patient suffer from calomel poisoning. In hyperacidity, indigestion and dyspepsia a compound pill named *Vadavanal Rasa* containing *Kajjali panchalavana* (five salts), *Yavakshara, Swarjikakshara* (carbonate of soda) and borax is recommended. Dose is 1 to 4 pills of 5 grains each *three* times a day. This was tried with success in cases of chronic gastritis (Ind. Drugs Report Madras). As antiparasitic and vermifuge combinations like *Krimimudgar Rasa* (see Ferrum), *Krimikalanal Rasa* (see Ferrum), *Krimidhuli Jalaprabha Rasa* (see Calcium) and *Krimi-rogari Rasa* (see Ferrum) are in use. In jaundice, mercury is used along with other alteratives and purgatives, as for example, in the compound pill called *Pandusudana Rasa* containing equal parts of mercury, sulphur, prepared copper, croton seeds and bdellium rubbed together with ghee and made into two-grain pills. They are given with the juice of *neem* bark and honey in jaundice. *Acids and cold water for drinking should be avoided.* For dropsy a compound pill known as *Vahni Rasa* is a specific. It is prepared thus:—Take of prepared mercury 4, sulphur, Curcuma longa, *Triphala,* each 2 parts, Ipomoea turpethum, Croton tiglium, Plumbago zeylanica, each 3 parts, dry ginger, black pepper, long pepper, Baliospermum montanum, and Cuminum cyminum each 8 parts. Reduce the whole to a fine powder, triturate it in the juice of Clerodendron phlomoides, Eclipta prostrata, and add Castor oil to make a pill mass. Dose is 5 to 10 grains, to be given in warm water. Another pill named *Lokanatha Rasa,* containing *Kajjali, Abhraka, Loha* and *Tamra bhasma* is useful in dropsy, jaundice and liver diseases. Dose is 1 to 4 pills three times a day with honey. In affections of the lungs, mercury is used in a variety of combinations. Following are a few examples:— *Rasendra gutika* prepared by adding 2 tolas of purified mercury, 1 tola of the juice of *Jayanti* leaves and of fresh ginger,

then soaking it in the juice of Jussieua repens and Solanum indicum respectively for 24 hours, and then mixing with it 8 tolas of purified sulphur previously soaked in the juice of *bhringaraja* and dried and rubbing together the whole with 16 tolas of goat's milk to form a pill-mass and dividing it into pills of 4 grains each. This pill is given with goat's milk and juice of ginger in bronchitis and cough generally—(Chakradatta). *Rajamriganta Rasa* contains the parts of *Rasa sindura,* one part each of prepared gold and copper, and 2 parts each of realgar, orpiment and sulphur, mixed and reduced to a paste with goat's milk and roasted in shells and taken out when cold. Dose is 4 grains with 2 grains each of long pepper, black pepper, honey and ghee; it is used with much benefit in phthisis and chronic bronchitis with fever—(Bhaisajyaratnavali). Another compound powder called by the same name contains red sulphide ash 3 parts, gold ash or *Suvarna bhasma* and *Abraka bhasma,* shell-lash or *Cowri bhasma* and borax each 1 part, realgar, orpiment and sulphur each 2 parts, mixed, powdered and roasted. Dose is 1 to 5 grains with honey or with confection of black pepper, long pepper in asthma etc. In diseases of the nervous system several combinations of mercury with gold, iron, talc etc., are used such as *Chaturmukha Rasa, Chintamani Chaturmukha, Yogendra Rasa* etc., which are all similar in composition slightly varying in the proportions of the active ingredients and their adjuncts. Thus *Chintamani Chaturmukha* consists of two tolas each of *Rasasindura,* one tola of prepared iron, half a tola of prepared gold, all rubbed together with the juice of Aloe indica and made into two-grain pills. This is used in nervous diseases, insanity, cephalalgia, deafness, noise in the ears, paralysis of the tongue, diseases of the female and urinary organs, phthisis, fever etc., and improves nutrition, increases appetite and strength and brightens the complexion. As a tonic in all conditions of debility, a compound pill called *Agnithundi Vati* the chief ingredients of which are sulphide of mercury, *trikatu, chitraka,* the carbonates of sodium and potassium nuxyomica, aconite etc., is given in dyspepsia, indigestion, colic etc.—(Sharangadhara). Dose is 1 to 4 pills of one grain each with milk or water after meals. To check asthma

and other forms of difficult breathing, mercury is used in the form of *Swasa Bhairava Rasa* or *Swasa Kuthar Rasa* which are both similar in composition (see under Bisulphuret of Arsenic). For flatulence and constipation a purgative called *Ichchabhedi Rasa* containing Cinnabar, borax, dry ginger and long pepper 1 part each and the root of Baliospermum montanum and *triphala* 4 parts each, mixed and powdered and the whole boiled in milk till reduced to the consistence of an extract. Dose is 3 to 5 grains. It is also given in dropsy (ascites). As an alterative tonic *Rasasindura* as well as its two other forms called *Shadguna balijarita Rasa sindura* and *Svarna sindura,* are much used in a variety of diseases; *Shadguna balijarita rasasindura* is simply *Rasasindura* obtained by sublimation, again sublimed with equal quantity of sulphur six times. It is superior to the ordinary *Rasasindura. Svarna sindura* is prepared out of one tola of fine leaf-gold, 8 tolas of purified mercury and 12 tolas of sulphur, all mixed and rubbed together till the mass becomes black and then sublimed in a glass bottle on the sand bath. These three forms of *Rasasindura* cure all sorts of diseases, but are particularly used in chronic fever, catarrh and cough of children, mental and bodily debility, anaemia etc.—(Sanskshiptasara). As an alterative in chronic diseases, *Trivikrama Rasa* is recommended. It contains prepared mercury, sulphur, *Tamra bhasma* in equal weights, triturated in the leaf-juice of *Nirgundi* to a paste and dried in a sandbath. Dose is 5 to 7 grains. It is of special use as a lithontriptic and is given in cases of uric acid diathesis, gravel etc. In the treatment of small pox *Rasasindura* is used in the form of *Kastur Bhusan;* it is composed of *Rasasindur,* mica, borax burnt, seed of *Danti,* camphor and musk, Cannabis and *Trikatu* rubbed with ginger juice and made into pills. These are administered with honey and paste of *Rudraksha,* when there is high fever, delirium or drowsiness, severe pain in the sides etc. When there is high fever with acute coryza and pain in head and body, during the first stage (incubative stage) *Svalpa Lakshmibilas* or *Kapha Chintamani* is recommended. *Kapha Chintamani* is composed of purified mercury, *indrajav,* burnt borax, black pepper, cannabis, *Rasasindura,* rubbed with juice of ginger

and made into pills; to be given with honey and juice of the leaves of *Tulsi* (Holy Basil). Mercury is used in syphilis both externally and internally; e.g., *Karpura Rasa*:—Make a paste of wheat flour with water. Take some of it and press with a finger in such a way that a depression is produced in the paste. Put a grain and a half of mercury in this depression and roll the paste to make a pill. No mercury should escape from the depression. Now coat this pill by clove-powder and swallow the pill carefully with water, so that it does not come in contact with the teeth. Later chew a betel leaf. Avoid acids and salts, also fatigue, exposure to the sun, exertion and coition. *Saptashali Vati* recommended in *Bhavaprakash* is made up of mercury and pulverised catechu each ½ tola (48 grains), pellitory root 1 tola (96 grains) and honey 1½ tola (144 grains). Grind all these together with a pestle and mortar till the globules of mercury disappear and divide into seven pills or boluses. One pill is administered every morning with water in primary syphilis. Acids and salt are forbidden during the use of this medicine. *Chandrodaya Rasa* made up of mercury *(Kajjali), Abhraka bhasma, Vanga bhasma, silajit* and cardamoms in equal parts, mixed together and triturated in the juice of plantain tree to form a pill mass is used in gonorrhoea, syphilis, leprosy, jaundice, etc. Dose is 2 to 4 grains. *Calomel* (*Rasakapura* or *Rasakarpura*) is prescribed by *Bhavaprakash* in syphilis, and he gives the following recipe for preparing Calomel:—"Take of purified mercury, red ochre, brick-dust, chalk, alum, rock salt, earth from ant-hill, impure sulphate of soda, and red earth used in colouring pots, in equal parts, rub together and strain through cloth. Place the mixture in an earthen pot, cover it with another pot, face to face, lute the two together with layers of clay and cloth. The pots so luted are then placed on fire and heated for four days, after which they are opened, and the white camphor-like deposit in the upper-part is collected for use". A preparation used by Hakims in cases of syphilis is made of mercury, mastiche and sugar 9 *mashas*, olibanum 15 *mashas*, and Frankincense 7 *mashas*, triturated and made into pills. Dose is 3 *mashas* continued for a week. As a tonic alterative useful in hemiplegia, paraplegia and paralysis,

a pill called *Ekangaveera Rasa* containing Kajjali, *Vanga bhasma, Loha bhasma, Naga bhasma* (Calcined Zinc), *Tamra bhasma, Abhraka bhasma* and Nux vomica is recommended. Dose is 1 to 4 pills of 2 grains each twice a day. A compound pill called *Vataraktantaka Rasa* containing mercury, sulphur, iron, orpiment, realgar, *silajit, triphala* and a number of other vegetable substances, is recommended in nervous diseases such as hemiplegia, paraplegia, facial paralysis, rheumatism etc. Dose is 1 to 4 pills of 2 grains each three times a day. "It was given to a case of hemiplegia in an old man with considerable benefit".—(Ind. Drugs Report, Madras). *Pradararipoo Rasa* containing cinnabar, *Naga bhasma* (calcined tin or zinc), *Rasanjana* (extract of Berberis aristata) and Symplocos racemosa is useful in leucorrhoea and chronic diarrhoea. Dose is 1 to 4 pills three times a day with rice water. "It proved to be efficacious in both the diseases".—(Ind. Drugs Report, Madras). For *external* application in syphilis (Mercury inunction)—48 grains of mercury is rubbed over the body with the juice of leaves of Michelia champaka by hand as long as mercury does not entirely disappear. The fomentation is to be applied by means of warmed hand applying over the body, to facilitate absorption. The inunction is to be done for 7 days. Avoid acids and salts; another method is, that, about a drachm (48 grains) of mercury is recommended to be rubbed between the palms with the juice of the leaves of Sida cordifolia till the globules of mercury are no longer visible. The palms are then to be warmed over the fire till perspiration breaks out from them.—(Bhavaprakasha). For (Mercury fumigation) *fumigation* in primary syphilis: Mercury, sulphur and rice, each 192 grains, are pounded together and made into a paste. The syphilitic is subjected to the fumigation for 7 days, by putting each part into fire each day;—about half a drachm of the black sulphide mixed with ¼ part of wheat-flour is employed daily for seven days in succession. In secondary syphilitic eruptions, a powder composed of two parts of cinnabar and one of realgar is used for fumigation. About 15 grains of this is used at a time. Powders for fumigation are heated over a fire of jujube tree wood and the vapour is applied to the skin under cover in a

closed room. In skin diseases like ringworm, eczema, prurigo, psoriasis etc., several applications containing mercury are used; *e.g.*:—Take of cinnabar, sulphur, red oxide of lead, rock salt, seeds of Cassia tora, *baberang,* Cleome felina and the root of Aplotaxis auriculata in equal parts, powder them and reduce to a thin *paste* with the juice of datura, neem or betel leaves—(Sharangadhara). For lice in the hair, mercury rubbed with datura or betel-leaf is recommended to be applied to the scalp—(Chakradatta). *Oleate* of mercury and morphine is used as an external application in obstinate and painful tonsillitis and inflammation of the lymphatic glands—(Ringer). An *ointment* of cinnabar is applied to bring about the resolution of buboes. An ointment made by boiling equal parts of sweet oil and cinnabar till it becomes black and then adding to it camphor and stirring uniformly is a useful application over boils. A *powder* of cinnabar, dusted into the eyes is a useful *collyrium* to cure ophthalmia.

---

## 29. PLUMBUM

*Sans.*—Seesaka; Naga. *Eng.*—Lead. *Arab.*—Ressas. *Pers.*—Anuk. *Hind. & Ben.*—Sisa. *Guj.*—Kalun sisun. ***Mah.* & *Kon.***—Shishay. *Tam.*—Iyam. *Tel.*—*Sheeshamu.* ***Can.***—Sheesa. *Mal.*—Tismahitam. *Burm.*—Khaipok.

Source.—Lead never occurs free in Nature, but is generally met with as sulphide *i.e.* galena from which it is obtained by roasting. It rarely occurs as oxide (minium) most frequently as carbonate (white lead ore). The red oxide of lead of minium was manufactured by the Ancients under the name of *Sindura.*

Purification.—(1) Lead is prepared and purified by roasting *galena* (sulphide of lead) in a crucible, then dropping the melted liquid through a hole into a vessel containing decoction of triphala or in the milky juice of Calotropis gigantea, when cool it is purified lead. (2) Leaves of lead are to be smeared with a paste of orpiment and the milky juice of Calotropis gigantea and roasted in a covered crucible till the metal is entirely killed. (Sir P. C. Ray's H. of H. Ch., Vol. I, p. 114).

Characters.—Lead is readily fusible, very heavy, presents a black and bright appearance on fracture, is of foetid odour and black exterior. (Sir P. C. Ray's H. of H. Ch., Vol. I, p. 112). It is bluish grey, soft, flexible metal, very malleable and slightly tenacious, freely soluble in nitric acid. It is not sonorous when pure. When heated to a white heat it volatilizes and the vapour when collected is known as oxide of lead or flowers of lead; when heated to fusion and exposed to air it forms a dross or pellicle or a yellow powder known as protoxide of lead or Massicot (*Hind.*—Murdarsing); at a still higher temperature over a brisk fire it forms crystalline scales of a brick red colour known as Litharge.

Methods of Preparation.—(1) *Seesa bhasma* or *Naga bhasma* (lead ash); it is prepared by reducing lead and calcining it with sulphide of Arsenic, then adding the juice of betel leaves and rubbing into a fine powder. Dose is ½ to 2 grains, with milk. (2) "Take of lead 20 *palas* and apply strong heat to it and drop into the molten metal one *karsa* of mercury and throw into it one after another the ashes of Terminalia arjuna, T. bellerica, pomegranate and Achyranthes aspera, weighing one *pala* each. The mass being vigorously stirred with an iron spoon for 20 nights in succession, the metal is calcined yielding a bright red ash." (3) Rub lead with the juice of Adhatoda vasica and melt it in an earthen pot, add to it one-fourth of its weight the ashes of Adhatoda and Achyranthes aspera and stir the mass with a rod of Adhatoda vasica and heat over a fire. Repeat the process seven times. The lead will be turned to vermilion-like power".—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 113).

Action.—*Seesa bhasma* is astringent; it is also a diuretic and vermifuge (anthelmintic). Externally it is used as sedative and astringent.

Uses.—It is useful in urinary diseases and in expelling worms; in chronic diarrhoea and other chronic discharges as leucorrhoea, gonorrhoea, menorrhagia, excessive suppuration, ulceration of the stomach, internal haemorrhages as haemoptysis, haematemesis etc., also used in cough with profuse ex-

pectoration, in night sweats; also employed with benefit in aneurism of the aorta, hypertrophy of the heart and in epilepsy. In caseous pneumonia it is given with digitalis and opium. *Externally* it is used in the form of *ointment* for excoriations, contusions, sprains, skin diseases accompanied with irritation etc.; as a *suppository* it is used in haemorrhage from the rectum as well as to soothe the irritation of piles. Prof. Blair, the Director of Cancer Research at the Liverpool Infirmary, has told the Toronto Academy of Medicine, of a number of cases of cancer which have been cured in Liverpool by the injections of lead. Dr. Adami, the Vice-Chancellor of the Liverpool University, said that Prof. Blair's declarations had been forced as the result of astounding cures of a number of cases that had hitherto been regarded as incurable. So many of these cases had been cured that the matter could not be kept private any longer. He added that owing to the nature of the treatment it had been proved that it is possible to treat only those cases that had been given up as hopeless. He added there had been cases of recrudescence owing to doses being too small but he declared that the success achieved indicated great strides—(Practical Medicine, Feb. 1926).

---

## 30. PLUMBI CARBONAS

(*Eng.*—White lead; Basic Lead Carbonate; Flake white lead; Basic Carbonate of Pb. (Plumbum); Hair powder. *Arab.*—Isfedaj. *Pers.*—Sufeadba. *Hind. Duk. & Ben.*—Sufeda. *Guj. & Mah.*—Sapeta. *Tam.*—Velliyya. *Tel.*—Shish. *Mal.*—Timaputih) is found in Nature both as crystallized and in a massive state. It is a soft heavy white powder, artificially prepared by suspending sheets of lead over the vapours of heated vinegar, when the air becomes charged with carbonic acid gas and the vapour of vinegar corrodes the plates. The corroded rust when collected is known as *Sufeda*. It is used locally as sedative and astringent, to protect irritated surfaces as in erysipelas, erythema, intertrigo etc. ***It should never be used when the skin is broken or abraded.*** Combined with butter it is used as *ointment* to eruptions on the scalp, to super-

ficial burns, over the unbroken skin in swollen and inflamed parts and excoriations and in small pox.

---

## 31. PLUMBI OXIDUM

(*Eng.*—Lead oxide; Flowers of lead. Massicot; Litharge; Monoxide of Lead. *Arab. Pers. Hind. Ben. Duk. & Mah.*—Murdosing. *Guj.*—Bodarakakaro. *Tam. & Tel.*—Mudarasingu. *Can.*—Mudadashringi. *Mal.*—Mudarsinka) is met with in pieces or powder. It is of a light yellow colour mixed with red and has a metallic lustre. It resembles mica very much in appearance. The powder is here and there impregnated with brick colored clay. In smell and taste it resembles *Gopichandana.* It is a powerful local astringent, cooling and an insecticide. *It is never used internally,* but *externally* as *ointment* etc., for baldness, itching and skin diseases. Its *paste* is a useful application for unhealthy ulcers. Dissolved in vinegar or in rosewater it is used in prickly heat, for eczematous eruptions and in removing freckles and acne. Its ointment is used for closing wounds. An *ointment* composed of Oxide of lead 3, *Rasakapur* 1, (Tamarix orientalis) 2, Simple oil 5 and wax 5 parts is a useful application to syphilitic chancres. Its plaster called *lead plaster* or Litharge plaster, is used to prevent bed sores, as a protective to wounds and ulcers, and as an application to keep the dislodged parts in *situ* and also to relieve pain from the inflamed parts.

---

## 32. PLUMBI OXIDUM RUBRUM

(*Sans.*—Raktanag; Sindura; Naga Sambhava. *Eng.*—Red lead; Minium; Red Oxide of Lead; Lead oxide. *Arab.*—Isrenj. *Pers.*—Suraj-sang. *Hind.*—Ingur. *Ben. Guj. Duk. Mah.* and *Kon.*—Sindur. *Can.*—Shindhura *Tam.*—Sagappusinduram. *Tel.*—*Yerrasenduramu. Mal.*—Chinturam; Galanggam. *Burm.* —H'sang) is obtained by heating oxide of lead to a very high temperature. It is bright orange-red or red, granular, crystalline powder. On applying more heat it becomes redder than purple and finally black. It is a local stimulant, used as *oint-*

*ment* or *liniment* in eruptive skin diseases as eczema; pustular eruptions etc.; to promote maturation of boils and abscesses, and the healing processes in all kinds of ulcers and wounds. As *ointment* made of *Sindura* and powdered black pepper with butter is applied in chronic eczema. An oil called *Sindura-dyataila* (Chakradatta) made up of mustard oil one seer, water four seers, *sindura* 4 tolas and cumin seed 8 tolas, boiled together in the usual way, is used in eczema and other eruptive skin diseases. The *powder* is used sometimes as a fumigation in syphilis. *Rajmrigank Rasa* which is used in phthisis and chronic bronchitis, contains *sindura* together with some other minerals as gold, arsenic, copper and sulphur.

---

## 33. PLUMBI SULPHURATUM (PbS)

(*Sans.*—Anjana; Sauviranjana; Krishna surma. *Eng.*—Galena; Sulphide of Lead. *Pers.*—Anjana. *Arab. Hind. Ben.* and other Indian Languages.—Surma) is obtained from the mountains of Sauvira, a country along the Indus, whence it derives its name. The Sulphide of Lead is of glimmering lustre, and is an ore of lead, occurs in cubic masses destitute of rays and is tabular in its crystalline arrangement. *Srotonjana* or *suffed surma* (white surma) is produced in the bed of Jamuna and other rivers. It, like the black *surma* or *sauvir anjana* is used as a collyrium for the eyes, but is considered inferior to the black surma or galena. *Sauviranjana* or galena is used as a cosmetic for the eyes and is supposed to strengthen these organs, improve their appearance and preserve them from disease. It enters into the composition of some collyria for eye diseases: Galena heated over a fire and cooled in a decoction of the three myrobalans for seven times in succession is rubbed with human milk and used in various eye diseases—(Sharangadhara). Another preparation recommended by the same is made up of purified and melted lead and mercury 1 part each, galena two parts; rubbed well and reduced to powder, to which is added and mixed intimately camphor 1/10th in weight of the mass. This preparation is useful in eye diseases. *Sticks* made of *surma*, camphor, *triphala*

mixed together in juice of Eclipta prostrata, Eugenia jambolana and Citrus limonum and dried and made into sticks or probes are used as an application inside the lids in ophthalmia: *Pessaries* of suitable sizes are made of equal parts of sulphide of lead, rose petals, olibanum, alum, borax, galls and gum arabic, for use as astringent pessary.

---

## 34. POTASSII CARBONAS IMPURA; POTASSIUM CARBONATE

(*Sans.*—Yavakshara; Darulawana. *Eng.*—Impure or factitious carbonate of Potash; Impure potash carbonate; Potash carbonate impure; Salt of Tartar; Pearl Ash; Potash. *Arab. & Hind.*—Javakhar; Khar. *Duk.*—Jhas-ka-namak. *Guj.*—Kharo. *Mah.*—Jhadichamitha. *Kon.*—Papad-Khar. *Tam.*—Mara-uppu; Sambal-uppu; Yavacharam. *Tel.*—Mannu-uppu. *Mal.*—Karam; Pappatak-mora-uppu. *Can.*—Marada-uppu) is found in all the three kingdoms of Nature. In the vegetable kingdom it is found either as carbonate of potash or as potash in combination with other organic acids. Plants absorb it from the soil and when incinerated their ashes give *Yavakshara.* Succulent plants contain a larger proportion of it than the woody parts. "Impure potassium carbonate has been known from very ancient times. Its principal source in India is wood ashes because potash is an indispensable element for the growth of most plants. But where it is associated with much silica and phosphoric acid the ashes contain not little carbonate, and are not available for the manufacture of potash. This, for instance, holds good for straw-ash. The value of an ash for the manufacture of potash is chiefly dependent upon the quantity of potassic carbonate it will yield upon the abundance of the wood or other vegetable product and the cost of labour. The undermentioned woods yield on the average, for 1000 parts, the following quantities of potash:—

**Pine 0.45; Beech 1.45; Oak 1.53; Willow 2.85; Wheat straw 3.90; Barley straw 5.80; Vine-wood 5.50; Stems of maize (Indian corn) 6.50; sunflower stems 20.00; dried wheat plant, previous to blooming 47.00.**

The preparation of potash from vegetable matter is affected in three operations, viz: (1) The lixiviation of the ash; (2) The boiling down of the crude liquor; (3) the calcination of the crude potash.—("Industry", Calcutta, April 1942, p. 12). In the mineral kingdom it is obtained from rocks where it exists as sulphates, nitrates, carbonates and silicates. It is also found in the felspar of granite. It is obtained by fusing rock-salt. It is an ingredient of various mineral waters. Of the animal kingdom it is an essential constituent. It is found in the milk, flesh and urine of persons who take citrate or tartrate of potassium. It is prepared by reducing to ashes the green spikes of the barley, dissolving the ashes in water, straining the solution through thick cloth and evaporating it over the fire. The resulting salt is a clear amorphous powder with a saline and partly acid taste. Chemically it is carbonate of potash with some impurities. It is stomachic, laxative, diuretic, antacid, resolvent and alterative.

Action & Uses in Ayurveda & Siddha.—Katu lavana rasam, ushna veeryam, katu vipakam, tikshnam, ruksham, lagu, kapham, ascites due to vatha, stones, mootra krichram, stomachic, heart-tonic, rakta pittam, pleeham.

Action & Uses in Unani.—Hot 3°, Dry 3°, carminative, removes obstruction in passages, in colic, digestive, cough.—(Therapeutic Notes).

Uses.—It is used in urinary diseases, uric acid diathesis, leading to gout and rheumatism, uterine irritability, piles *shula* (colic), cardialgia, acid eructation, dyspepsia, enlargement of lymphatic and secreting glands as the breasts, testicles, mesenteric and scrofulous glands, also of the liver, spleen and salivary glands. A decoction of chebulic myrobalans and *rohitaka* bark *(Amoor rohitaka)* is given with the addition of Carbonate of potash and long pepper in enlarged spleen and liver and in tumours in the abdomen called *gulma*—(Sharangadhara).—In strangury or painful micturition, carbonate of potash with sugar is considered a very efficacious remedy. **Carbonate of Potash is given to persons who are gluttonous in eating and drinking.** It is useful in dropsy. It enters into

the composition of numerous saline medicines. The following are a few useful simple remedies:—(1) *Yavakshara* 10 grains, leaf-juice of Adhatoda vasaka 10 drops and clove powder 5 grains, mixed together and given with betel-leaves is useful in bronchitis. (2) A compound powder containing *Yavakshara, Saindhava,* dry ginger, each 5 parts, chebulic myrobalan 10 parts, all mixed and powdered is useful in doses of 10 grains, with buttermilk or whey, or *conjee* or hot tea, in cases of piles, dysentery, colic etc. A *modaka* or confection containing powders of *Yavakshara* ½ tola, *trivrit* and *triphala* 1½ tolas each, Baberang seeds and round pepper ½ tola each, mixed well with sugar and ghee or treacle, is administered in required doses as an all-round purgative. It is "very effective in allaying abdominal cysts, pelvic cellulitis, disinclination to food, intestinal worms and many other diseases arising out of the deranged condition of *Kapham* and *Vayu*" (Kamala Kanta Sharma, Jour. of Ayur. June 1925). (3) Karabudin Kadri recommends for emphysema, a compound pill, containing equal parts of *Yavakshara,* long pepper and dried juice of Calotropis gigantea; made into pills about the size of a pea. Dose is one pill four times a day. Locally the solution of carbonate of potash is useful in chronic skin diseases such as lepra, pityriasis, acne, urticaria, and lichen, relieving itching etc. Its solution is added to bath to relieve gout and rheumatism and to promote the growth of eruptions, if suppressed, as in measles, small-pox, scarlatina etc. Pundit J. L. Duveji prescribes an external application containing potassium carbonate as a "remedy for plague". It is thus prepared and applied—"Mix well Potassium Carbonate in sesame oil and boil till a thick consistency is arrived at. Apply this coating on the affected glands which should be well covered with betel leaves. Heat a bunch of cotton over the fire and apply this over the covered glands repeatedly so as to produce warmth".

---

## 35. POTASSII NITRAS; or P. NITRICUM or POTASSIUM NITRATE; POTASSIUM NITRAS

(*San.*—Yavakshara; Saindhava. *Hind. Ben. Punj. & Duk.*—Shora; Sora; Shorakhar. *Eng.*—Saltpetre; Nitre; Nit-

rate of Potash; Purified Nitre. *Arab.*—Abkar; Ubkir. *Pers.*—Shoraba; Shore. *Hind. & Guj.*—Shora. *Mah.*—Shora-mitha. *Guj.*—Shorakhar. *Tel.*—Patlu-uppoo; Chitloo-Bhusmoo. *Tam.*—Pottil-uppu. *Mal.*—Veti-uppu. *Can.*—Patluppu; Sendur lavana. *Kon.*—Sindurlavana. *Sinh.*—Potlunu. *Malay.*—Sundawa. *Burm.*—Yandzeing; Yan-zin) occurs extensively in Bengal, Punjab and Upper India, naturally as an efflorescence on the soil; but the nitre obtained in the bazaars is generally impure. For medicinal use, the earth containing the crude salt is dissolved in water, strained and recrystallised by boiling and evaporation. It is also obtained from collections of the saline earth after the rains, from the land inundated during the rains and from mud heaps, mud buildings, and other places on which it is formed and then subjected to a process of solution and filtration through a crude mud filter. The impure nitre is known as *Dhoah* and contains about 45 to 75 per cent of the actual salt, the remainder being sulphate and chloride of sodium and insoluble matter. It is again dissolved and crystallized before it is sent, under the name of *Shora Kalmi* (refined) to the bazaars for sale while it is further recrystallized in Calcutta and elsewhere before being sold for use. Potassium nitrate in solution is a refrigerant, efficient diuretic and disphoretic. It acts on the vascular system and thus reduces the frequency of the pulse. Given in the solid form or in concentrated solution it acts as irritant. In weak *solutions,* 1 to 2 drachms in a quart of thin warm rice *conjee* it is an excellent refrigerant drink in fevers with hot and dry skin, parched tongue, with great thirst and scanty and high-coloured urine. It may also be sweetened with honey or sugar-candy; or tamarind or lime juice may be added to improve the flavour if desired. It is useful also in the early stages of dropsy, in cases of smallpox, measles, influenza, catarrh, gonorrhoea, acute rheumatism, bleeding from the lungs, stomach, uterus or other internal organs attended by fever. In colic, a *powder* containing nitre, black pepper and *sanchala* salt in equal parts is recommended to be given in doses of 10 grains in lime-juice, and in bronchitis in children above 5 years, a powder composed of nitre 5, sulphate of iron, ammonium chloride and sulphur 4 parts each is recommended to be given. Dose is 1

grain—(Khory). A compound preparation known as *Laghu Sankha Dravakam,* which smells strongly of nitrous fumes and which is made of country nitre 6 *palams,* alum 4 *palams, Yavakshara,* Ammonium chloride, borax and vit salt 2 *palams* each and gandhaka vadiuppu (a nitre variety), soda carbonas, ferrous sulphate, copper sulphate and black salt (*Suvarchala-uppu*) 1 *palam* each, all powdered and distilled, is recommended for the relief of all liver complaints, by Vaidyas. This was tested by Dr. Koman and he said:—"In one of my cases (cirrhosis of the liver with ascites) which is under treatment from 14th August 1918, it is doing some good, as the patient had to be tapped only once five weeks ago, and very little fluid has accumulated since then"—(Ind. Drugs Report, Madras, Dec. 1918). In gonorrhoea a mixture of nitre 10 grains in a wine-glassful of decoction of Abelmoschus esculantus twice or thrice a day is a nice remedy. Zad-Garib recommends a *powder* made of equal parts of saltpetre, cardamoms, cubebs, soap-stone, olibanum and Cucuma longa. Dose is 3 *mashas* or 35 grains three times a day. A mixture of nitre 2 parts and leaf-juice of the Radish 1 part is given in doses of 80 grains to relieve scalding and retention of urine, also suppression or scantiness of urine. A *confection* made of nitre 5, cinnamon 4, chebulic myrobalan and Iris pseudocorus, each 3, cardamoms 5 and sugar 20 parts is used in chronic gonorrhoea and gleet. Dose is 1 drachm. In obstinate cases of leucorrhoea a combination of nitre 10 grains and alum 5 grains is recommended to be taken thrice daily. It may be advantageously given with infusion of Moringa root. In the early stages of inflammatory sore-throat, a small piece of nitre allowed to dissolve slowly in the mouth is a successful popular remedy. In asthma, in chronic bronchitis and other spasmodic coughs, inhalation of the fumes of burning nitre papers, previously soaked in saturated solution of the nitrate and dried (sometimes combined with *Datura* and other drugs) gives great relief. For this purpose, pieces of moderately thick blotting paper are used. Whenever an attack threatens, one or, if necessary, two pieces of this paper, are burnt in the patient's bed-room so that the fumes may be freely inhaled, preferably at bed time, care being taken to prevent the escape of the fumes; but it should

not be held too near the face or the fumes may prove too irritating, and increase rather than diminish the symptoms. *Solution* of Nitre is a good topical application for bruises and abrasions and for the cure of freckles. Locally nitre is employed for the relief of headache and delirium in fevers in the form of a cold and agreeable *lotion* for the head, made by dissolving two ounces each of nitre and sal ammoniac in a big bottle full of water; this is applied by constant relays of freshly-wetted clothes. In acute rheumatism, a strong solution of nitre (three ounces to a pint of water) forms a more soothing application to the swollen and painful joints; cloths saturated with it should be kept constantly applied; the case which it affords is often very great. Also internally it may be given in doses of 40 grains gradually increased to 60, 90, up to 120 grains twice daily, the vehicle being half a pint of warm rice *conjee*. The quantity of nitre may be diminished as the severity of the symptoms subsides.

---

## 36. SILICUM (Eng.—Silicon)

Source.—Very common non-metallic element obtainable in 3 different forms, the amorphous, the graphitoid and the crystalline—from Silica or pure flint: found in Nature as Silicon dioxide in rocks, crystals, sand, flint, quartz, agate and various other stones, and in earths and clay; also as Silicates in baysalt, felspar, granite, mica, porphyry i.e., minerals and metallic oxides, etc.

Manufacture.—Heat together fluoride of potassium and silicon with its equal weight of metallic potassium. Throw the fused mass into cold water, when silicon will be left behind.

Characters.—Crystal or amorphous, dry dark-brown powder, non-fusible, insoluble and non-volatile. Heated in the air it becomes converted into silica.

Uses:—Used both externally or internally, in the form of an alkaline silicate chiefly—some forms in dentifrices, and others in pharmacy.

---

## 37. SILICATE OF ALUMINA

(Falspar or Clay)—See Aluminii Silicas.

---

## 38. SILICATE OF ALUMINA, LIME & OXIDE OF IRON

(*Ben. & Hind.*—Gil. *Ind. Bazaar.*—Gil-i-abrorshi; Gil-e-far; Hasan dhup) is a variety of clay, existing in amorphous irregular masses of a yellow colour of somewhat astringent taste and of smell resembling that of *Multani mati.* It it found in the deposit from mineral springs containing sulphur. Its action and uses are similar to those of *Multani mati.*

---

## 39. SILICATE OF ALUMINA, MAGNESIA & OXIDE OF IRON

(*Eng.*—Armenian Bole; Native Ferric-oxide. *Pers.*—Gile-armani. *Arab.*—Tene armani; Hajrarmani. *Punj.*—Harmazi. *Hind.*—Gherumitti. *Mah.*—Phula-geru. *Tam.*—Sime-kavikallu. *Tel.*—Sima-kavirai) is a calcareous mineral often made into small cakes and stamped with certain impressions. It is usually prepared by mixing pipe-clay or common chalk with oxide of iron or red ochre. It occurs in powder or irregular pieces of a reddish brown or variegated colours. It is soft and somewhat heavy. On section it is granular and sprinkled with white particles, and the cut portion resembles a piece of rhubarb. When exposed to the air, it absorbs moisture very rapidly. If thrown into water it readily crumbles into atoms. When put into the mouth it sticks firmly to the tongue. It is refrigerant, astringent, absorbent and antiseptic. It is used as a *powder* or *paste.* Dose is 5 to 30 grains. Internally the *powder* with cream is given in advance cases of dysentery. A *paste* made of it 2 parts, alum 4 and rose water 10 parts is given internally for scalding in the urine. *Externally* a paste of it is applied to inflamed and swollen glands, also to ulcers and raw surfaces. A paste of it and Vernonia anthelmintica equal parts with a sufficient quantity of *Subja-no-rasa* (Cannabis sativa) makes a useful

application to glandular swellings. *Gopichandan* and *Multani mati (Eng.*—Fuller's Earth. *Pers.*—Gil. *Tam. & Tel.*—Gope) are both varieties of Armenian Bole.

---

## 40. SILICATE OF ALUMINA & OXIDE OF IRON

(*Eng.*—Bole Rubra; Red Earth; Ruddle or Red Ochre. *Pers.*—Gile-surkh. *Arab.*—Magrahai. *Sans.*—Gairika; Rakan-pashana. *Hind.—Gerumati. Mah.*—Geru. *Tam. Tel. & Guj.* —Sona-geru; Hiringi powdee) is a clay found in lead and iron ore and contains an excess of oxide of iron over any other clay. There are two varieties:—bole (yellow) and red ochre. The red ochre contains more iron than the bole and is used in medicine. It sometimes occurs in powder and sometimes as hard pieces. " '*Gairika*': hematite, which is red and often hard, and limonite which is yellow or brown, both occur in the form of ochres."—Sir P. C. Ray. It rapidly absorbs water if poured upon it. It is purified by being soaked in milk seven times and is sweetish, astringent, cooling, useful as a local application to burns, ulcers, boils, pustular eruptions and aphthous sores about the mouth. It is rarely used internally except as an ingredient of some compound preparations containing a large number of mineral drugs, for instance *Jvara-kunjara Paridra Rasa* which contains nearly all the mineral substances. Besides *gairika* several other varieties of earth are occasionally used in medicine; *e.g.*—a sweet scented earth brought from Surat and called *Saurastra Mrittika* is astringent and useful in haemorrhages. It enters into the composition of several medicines for relieving bleeding from internal organs.

---

## 41. SILICATE OF LIME

(*Eng.*—Fossil encrinite. *Pers.*—Sang-e-yahuda. *Hind. & Bom.*—Hijrata Hau) is a fossil stone occurring as a petrified, oblong, obtusely pointed fruit sometimes with a stalk. It is about ½ to 1½ inches long. The surface is ribbed longitudinally; each rib is tuberculated. Externally the colour is dirty-

grey traversed with dark brown furrows, and greenish white within. A *paste* of it is prepared by pouring boiling water on the stone and allowing the mass to cool. A *bhasma* is prepared by braying the stone in lime-juice and incinerating. It is cooling and demulcent and given in gonorrhoea with benefit. As a drink it is useful to check vomiting. A paste made of the *bhasma* brayed in lime juice is a useful application to vesicular eruptions in children, to itch, ringworm etc. *Sang-e-Sira Mahi* is also a Silicate of lime, a variety of lime stone, resembling in colour, form and appearance, human incisor teeth. Externally it is shining, glabrous and of a brownish white colour, biconvex and broad at one end and obtuse at the other. The action and uses are similar to those of *Sang-e-Isama* which is the Silicate and Sulphate of lime. It is a kind of marble, of various sizes, of a dark brown color, polished smooth and mottled with light-red spots; when cut into, the interior is of a deep grey colour and looks as if sprinkled with particles of mica. Brayed in water it is used as a diuretic and lithontriptic; it is given in retention of urine and in diseases of the urinary organs. Externally it is applied as a cure for itch and other chronic skin diseases.

---

## 42. SILICATE OF MAGNESIA

(*Eng.*—Hydrated Magnesium Silicate; Soap stone; Talc. *Pers. & Hind.*—Singe jerahata. *Mah.*—Shankha jiri. *Guj.*—Sankha jirun. *Can.*—Veesaj. *Tam.*—Bulpam) occurs in brownish-white or grey flat irregular pieces or thick masses, smooth and unctuous to the touch, appearing like a soap. It is insoluble in water, tasteless, easily puverizable, yielding a soft slippery powder. On section the cut surface is silvery, shining and granular. It is a powerful astringent, desiccant and styptic. Dose is 5 to 20 grains. With milk, cream or brown sugar, it is used internally in dysentery, diarrhoea, menorrhagia and leucorrhoea. A compound powder made up of the soap-stone and *Vansalavana* (Silicious concretions of bamboo) 5 parts each, cubebs and cardamoms 4 parts each, is used in gonorrhoea, dysentery, menorrhagia etc., in doses of

10 to 15 grains. *Locally* it is applied to syphilitic sores and ulcers; also checks bleeding from the nose and wounds. A compound *ointment* made of *Sankhajirun* 5, asafoetida and oxide of lead, each 2 parts, *Kamala* 3, neem leaves 4, wax and simple oil each 10 parts, is useful for foul ulcers, chancres etc. A *paste* of it is applied with whey to burns and scalds with benefit. A paste made of it with catechu (5 to 1 part respectively) with the addition of sufficient ghee is a useful application in syphilitic ulcers and sores.

---

## 43. SILICATE OF MAGNESIA & IRON

(*Sans.*—Gorochana. *Eng.*—Bezoar stone; Mineral stone; Serpent stone. *Pers.*—Padzahre-kani. *Arab.*—Faduj madani or Badzahra; Hazr-ul-bahr. *Hind.*—Pedaru bazara. *Duk.*—Kani-pas-zehar. *Bom.*—Pouzera Madani. *Guj.*—Zera Mohra. *Sinh.*—Visagul. *Tam.*—Visha-kallu; Pamu kallu. *Tel.*—Geruda-petsaprai) is a variety of soap stone occurring in very irregular and angular pieces of light yellow colour of various shapes and sizes, it resembles pieces of marble or tamarind stone. The surface is generally rough. The taste is astringent. The smell resembles that of pipe clay. It is a nervine tonic, deobstruent and astringent. Dose is 1 to 2 grains. It is used in cholera, obstinate vomiting, diarrhoea in children and in profuse or troublesome and painful menstruation. A *paste* of it is used as a gargle in salivation. With Terminalia chebula its paste is applied to the mouth of children in stomatitis.

Silico-Fluoride of Sodium.—See Sodii Silicofluoridum; under Sodium.

---

## 44. SALINE SUBSTANCES

Saline substances include Salts and Saline earths. There are two varieties of salts used in Medicine:—(*a*) Those which exist in Nature and are known as natural salts and (*b*) those which are artificially prepared. The natural salts are:—

(1) *Saindhava;* (2) *Samudra lavana;* (3) *Sambhar.* Susruta describes the following varieties of salts *viz.,* (1) *Saindhava;* (2) *Samudra;* (3) *Vit* or *Vid lavana,* (4) *Sauvarchala;* (5) *Romaka;* (6) *Audbhid;* (7) *Gutika;* (8) *Pansuja* also called *Ushasuta.* The first five pass by the name of *Pancha lavana* or the five salts and are often used in combination. *Pancha lavana* is a carminative, laxative, stomachic, tonic, given in colic, indigestion and enlargement of the liver and spleen. It is made up of *Saindhava* 1, *Samudra* 2, *Sambara* 3, *Sanchal* 4, and *Vid lavana* 5 parts. *The other varieties of salts are rarely used in medicine. Audbhid lavana* is a name applied to *Shora* or salt-petre.

*Saindhava* literally means produced in Sindh, or the country along the Indus. The term is applied to rock salt which is regarded as the best of salts. Three varieties of rock salt are recognized, *viz.,* white, red and crystalline. The pure white crystalline salt is preferred for medicinal use. For alimentary purposes also, rock salt is considered superior to the other varieties.

*Samudra* literally means produced from the sea, i.e., derived from the evaporation of sea-water. The term is applied to sun-dried sea-salt, which is called *karkach.* Orthodox people consider common salt as impure owing to its having undergone the process of boiling, and who take only rock salt, substitute *karkach* for rock salt, if the latter is not available. Sun-dried sea-salt is described as somewhat bitter and laxative. In other respects its properties resemble those of rock salt. Uses:—In the place of gauze, ordinary '*pichu*' or clean cotton or a piece of cloth boiled in *Samudra Lavana* 1 tola and hot water 1 measure or *padi* (120 tolas) may be used for ulcers, wounds or abscesses after their operation. These pieces of cloth may be preserved in wide-mouthed glass bottles closed so as not to be contaminated with dust.

Source.—*Vit lavana, Vida or Vidam* is an artificially prepared salt in dark-red shining granules, in Upper India chiefly at Bhewani in Hissar Dist. (*Sans.*—Krishna lavana; Sanchal. *Eng.*—Black salt; Sanchal Salt. *Hind.*—Padelon; Kalanimak.

*Ben.*—Kale-nun. *Mah.*—Kalamith). It has a mild, saline and somewhat nauseous taste. "The salt has a reddish-brown colour and consists mainly of Sodium Chloride with traces of sodium sulphate, alumina, magnesia, ferric oxide, and sulphide of iron. 'Most of the samples examined were found to evolve minute quantities of sulphuretted hydrogen when treated with an acid; even when placed in the mouth the taste of this gas was distinctly felt. It is very probable that when the saline mass is fused with the organic matter (T. Chebula), a portion of the sodium sulphate is reduced to sulphide, which by double decomposition converts the traces of iron salt present into the sulphide'. The sulphide was detected both in the insoluble residue as (FeS) as well as in the aqueous extract".—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 245). It is manufactured thus:—

*1st Method:*—56 lbs. of sambar salt are mixed with 20 ounces of dried emblic myrobalans; ¼ of these materials is put into a round earthen pot with a narrow mouth, which is put in a fire-place made of clay. The fire-place has a hole at the bottom for introducing the fire-wood. After the fire has been lighted about an hour, and the materials in the pot appear to be heated, the rest of the materials are added by degrees. The whole is then exposed to a strong red heat for about 6 hours. The fire is then allowed to die away, and the pot to cool; which upon being broken is found to contain about 48 lbs. of *Vitlavan.*

*2nd Method:*—"Heat together in a large earthen pot 82 lbs. of common salt, 1 lb. of the fruit of Terminalia chebula, and 1 lb. of Phyllanthus emblica, and 1 lb. of impure carbonate of soda, until by fusion of the salt the ingredients are well mixed, when the pot is removed from the fire and its contents allowed to cool and form a hard cellular mass".—(Sir P. C. Ray).

*Vitlavana,* besides possessing the properties of salts in general, is carminative, aperient, tonic and stomachic, and useful in enlarged spleen and liver, flatulence, colic, dyspepsia, indigestion, bowel complaints etc.

*Sauvarchala* (*Hind.*—Sonchal; Kalanimak. *Bom. & Mah.* —Soratimati. *Can.*—Turarimannu. *Ben.*—Saurastra-mruttika) is aromatic, agreeable and digestive and useful in the same sort of cases as *Vitlavana.* It is "a dark coloured salt made by dissolving common salt in a solution of 'sajimati' (crude soda) and evaporating it; this salt contains chloride of sodium, sulphate of soda, caustic soda but no carbonate of soda". It is "stomachic, digestive, purgative, demulcent, bilious and beneficial in *Sula,* abdominal tumours, intestinal worms and dysentery".—(N. N. Sen Gupta).

*Romaka,* also called *Sakambari, Sambharnuna* or *Godalavana,* is the salt produced from the Sambar Lake near Ajmer. It is called *Vadagru mithu* in Bombay, *Savara mith* in Hindi, *Sambar luna* or *mitha* in Marathi. It is obtained by the evaporation of salt water from the river in the shape of clear rhomboidal crystals like alum. It has a pungent taste and is laxative and diuretic, in addition to possessing the other properties of salts. It is said to be the best and purest of evaporated salts.

*Audbhid* (*Vern.*—Reha; Kalar) which enters in the composition of '*panch-lavana*', is produced of itself from the earth, as efflorescences on reh lands. "The efflorescences thus produced consist of three groups; 1st: the neutral, which contain no carbonate of soda (these consist chiefly of sodium chloride and sulphate, and frequently magnesium sulphate); 2nd: the alkaline chlorides and sulphates, but no lime or magnesian salt; 3rd: the nitrous efflorescences". (Dr. Center's Note on *Reh* quoted in Watt's Dictionary of the "Economic Products of India", Vol. VI Part I, pp. 410-417.) "This is a ready explanation of the conversion of mercury and other metals into their chlorides when they are heated in combination with *audvida* and other salts. The magnesium sulphate would readily yield sulphuric acid, which with sodium chloride and nitre, might be expected to produce aqua regia" (for further information, see under *"Rasakarpura"* or the chlorides of mercury). It contains principally of sulphate of soda (sodium sulphate) with a little chloride of sodium, (sodium chloride). In addition, there are sometimes carbonate of soda, and some

magnesium sulphate. It is alkaline, bitter, pungent and nauseating. It is said to be so abundant in some parts of the Punjab as to render the soil quite barren. *Some physicians or rather writers substitute this article for sambar salt in the composition of pancha lavana or the five salts.*

*Gutika* salt, mentioned by Susruta and some later writers, cannot be identified at present. The name *gutika* is said to be derived from the circumstances of the salt assuming a hard, granular or nodular shape from boiling; so that it is a sort of boiled salt. Susruta describes it as stomachic, digestive and laxative.

*Pansuja* or *Ushasuta* literally means, salt manufactured from saline earth. *Panga* or common salt, manufactured from earth impregnated with salt water, would come under this head. It is "demulcent, stimulant, stomachic, generative of digestive fire, laxative, bilious and productive of burning".—(N. N. Sen Gupta).

The saline earths include:—(1) *Javakhara* (Potash Carbonate impure); (2) *Navasagara* (Ammonium Chloride); (3) *Papadkhar* (Pearl Ash); (4) *Sajikhara* (Carbonate of Soda); (5) *Shorakhar* (Saltpetre); (6) *Tankankhar* (Borax).

---

## 45. SODII CARBONAS IMPURA or SODIUM CARBONATE

*Sans.*—Sarjikakshara; Trona or natron. *Eng.*—Dhobi's earth; Washing Soda; Salsoda; Crude carbonate of soda or sulphate of soda; soda carbonate; Barilla; Sodium Carbonate —Crystalline; Soda Ash; Soda crystals; Crystal carbonate. *Pers.*—Shikhara; Tine-gazur. *Arab.*—Tile-milahul-gile. *Hind. Guj. Mah. & Kon.*—Sajjikhar; Sajikhara. *Duk.*—Cour-ka-namak; Sajjinoon. *Tel.*—Savite-mannupu. *Tam.*—Choon-too-munnoo; Sanchhikaram.

Source & Varieties.—There are three varieties of Carbonate of Soda, each known by its peculiar characters. These are:—1. *Sajjikhar* or Barilla; 2. *Sajjikhar-naphul* or Wash-

ing Soda or Soda crystals; 3. *Bangada-khara* or very impure carbonate of soda, which contains a large quantity of Silica. All these varieties are found in the ashes of Chenopodiaceous plants, a species of salt worts growing near the sea. "Crude carbonate or sulphate of soda is an alkaline earth found in large quantities where white granite forms the sub-soil. It is generally found in the hot weather as an efflorescent sandy deposit covering large tracts of open country. It is scraped off the surface to about 3 inches deep and then boiled with a little quicklime and made into cubes for sale, in cart-loads. Also obtained from kelp or barilla by incinerating sea-weeds, from Dhobi's earth by adding quick lime to the earth, and boiling repeatedly with water.

Constituents.—It contains 25 p.c., of Sodium carbonate. Sodium carbonate (washing soda) is obtained by lixiviation and crystallization of barilla. Chemically it consists of carbonate of soda with certain impurities such as organic matter, sulphate of soda, potash etc.

Characters.—It occurs in porous, granular masses, of a greyish white color or as heavy hard pieces, with a strong alkaline taste of soda.

Action.—It is antacid and alterative; also a diuretic. The properties are generally like those of *Yavakshara*, but inferior to it.

Uses.—It is useful in dyspepsia with vomiting, diarrhoea and flatulence. It is an efficient remedy in urinary diseases, as uric acid, gravel and suppression of urine. In Bright's disease of the kidney with abundant sediment in the urine; and in diabetes the habitual use of this salt has a marked beneficial effect. In rheumatism and gout *Sajjikhar* is given internally with benefit. A powder known as *Sajjikadya Churna* made up of *Sarjikshara* and *Yavakshara* and *Pancha lavana* all equal parts, powdered and soaked in lemon-juice or the juice of pomagranate fruits and dried in the sun, cures dyspepsia with severe pain after meals, ascites and loss of appetite. Dose is 20 grains—(Sharangadhara). A powder made of *Sarjikakshara* and *Yavakshara* 5 parts each, dry ginger and

*Sanchala* 4 parts each and *pipli* 3 parts is given in hot tea for colic, indigestion etc. In amenorrhoea a *paste* made in milk, of equal parts of *Sajjikhar, nayaphataki pana* (Heart pea), sweet flag and *Asana* is useful. Dose is 1 drachm. It is used in the form of a bath in lichen, prurigo lepra and pityriasis; also in burns of the second and third degree. In herpes of the scalp and in scaly diseases of the skin it is an efficient topical remedy. A saturated solution of it is applied to burns and scalds, also to rheumatic joints. A crystal of soda dipped into water and then gently applied to the burnt spot gives instantaneous relief of pain in burns of the first degree. In those of the 2nd and 3rd degree, a compress wet with a 10 p.c. solution of the soda may be applied. A week solution of it is injected into the vagina to check leucorrhoea. A paste made of equal parts of *Yavakshara* and *Sajjikhara* with water is applied to abscesses for opening them and for the removal of local inflammation. An ointment made of *Sajjikhar*, slaked lime and seeds of Psoralea corylifolia each 4 parts and copper sulphate 1 part and ghee 4 parts is useful in itch.

---

## 46. SODII BIBORAS; S. BORAS

*Sans.*—Tankana; Tunkana; Rasashodhan. *Eng.*—Sodium Biborate; Sodium Borate; Biborate of Soda; Borax tynkal; Borax; Biborate of Sodium; Pyroborate or Tetraborate Sodium; Sodium Pyroborate. *Hind.*—Tinkal; Tincal; Sohaga. *Ben. Duk. & Punj.*—Sohaga; Suhaga; Tinkar; Tinkal. *Kash.*—Vavut. *Arab.*—Buraekes-saghah. *Pers.*—Tinkar-tankar. *Tibetan.*—Chusal. *Bom. & Guj.*—Tankan-khar; Kuddia-khar. *Kon. & Mah.*—Kankankhar. *Tel.*—Velligaram; Elegaram. *Tam.*—Venkaram; Vengaram. *Mal.*—Ponkaram. *Can.*—Biligara. *Sinh.*—Pushara. *Burm.*—Lakhiya. *Malay.*—Pijar; Palleri.

Source.—It occurs as a natural deposit. Crude borax is found in masses by evaporation of water, on shores of dried up lakes in India and Tibet; it is also obtained from the mud of lakes surrounded by hills in Nepal. In this crude state it is known as *Sohagoor* or *tinkala*. When purified by dissolving

it in water, straining through cloth, evaporating to dryness and crystallizing, it is called borax or *tankan khar*.

Characters.—It is composed of boric acid and soda. In the native state it exists as an impure saline incrustation of a dirty-white colour. It exists as crystalline tough masses or in the form of translucent irregular masses. Exposed to the air it becomes opaque. Another variety known as *Telio tankana* is an impure salt met with in small pieces or smooth, translucent six-sided prisms. The colour is greyish-white; on exposure it becomes opaque or dirty white. It has a faintly balsamic odour and tastes like *papada khar*.

Purification.—Borax is purified by being steeped for a night in *Kanjika* (whey) and dried in the sun.

Action.—Diuretic, emmenagogue, astringent, antacid and local sedative and antiseptic.

Uses.—Borax is given internally in doses varying from 10-30 grains, in acidity of the stomach, amenorrhoea, dysmenorrhœa, menorrhagia, puerperal convulsions and to promote uterine pains during labour. As a solvent it is given in uric acid diathesis with good results. Dose is from 20 to 40 grains for an adult. In the *Kaphaja* type of fevers a pill called *Kapha-ketu Rasa* made of aconite, borax and reduced conch-shell in equal parts, powdered, mixed well and soaked over three times in the juice of fresh ginger and made into pills of two grains each is given with honey and ginger-juice. This is used in all sorts of phlegmatic complaints from common catarrh to bronchitis and pneumonia even attended with discharges from the ears and the nose. In prolonged and tedious labours due to want of action or power in the uterus to expel the foetus, and in abortion under the same circumstances, 30 grains of borax with 10 grains of powdered cinnamon in a little warm *conjee* may be given every one or two hours to the extent of three or four doses. This may also be given in convulsions attendant on labour. In cases of suspension or irregularity of the menstrual discharge and in some chronic uterine affections, doses of 10 grains with 10 grains of cinnamon occasionally prove useful. It acts with betel-

juice in 4 to 8 grain doses as preventive of ague. In small doses it is given to children as a laxative. It is also used in loss of appetite; painful dyspepsia, cough, asthma and diarrhoea. As an antiseptic, it destroys low vegetable organisms, hence given in foetid stools of diarrhoea in children. As a sedative to the mucous membranes in irritable condition of the fauces and pharynx, in chronic bronchitis of children, in cystitis etc., it is given with benefit. A few grains of borax or boric acid will sometimes remove an obstinate cough in a young child, and especially if this be associated with an irritable condition of the fauces or pharynx—(Judson). Glycerine of borax in 10 to 20 drop-doses is very beneficial in the treatment of summer diarrhoea of infants. It checks the griping pains, deodorises the offensive motions, and stops the diarrhœa (Dr. E. A. Sympson). It is used by Hakims and Vaids in the convulsions of infants and children, in doses of 1 to 5 grains, given in mother's milk, according to the age of the child. Five grains of borax and three grains of pepper with a teaspoonful of honey, given thrice a day is very effective for bronchitis and asthma in adults; for children the dose is proportionate to their age. Five grains of borax eaten with betel leaves has been found to be effective in importance. Five-grain doses with treacle has been employed as a deobstruent in internal tumours of the abdomen. In epilepsy it is useful where bromides have no effect. Dr. Gowars has found borax useful in some cases of inveterate epilepsy in which bromide has no influence; but that the influence of borax is not comparable to that of bromides in cases in which this is effective. He says that the administration of the drug may be continued for years in doses of 15 to 30 grains thrice a day after meals, without any ill effects beyond a possible eruption of psoriasis amenable to arsenic. Gastro-intestinal disturbance usually occurs at the beginning of the treatment, but diminution of the dose is said to be all that is necessary to correct this. Borax enters into the composition of numerous formulae for dyspepsia, loss of appetite and indigestion, such as the *Amritakalpa rasa, Tankanadi Vati* etc. *Amritakalpa rasa* is prepared thus:—Take of mercury, sulphur and aconite, one part each, borax three parts, soak them for three days in the juice of Wedelia

calendulacea and make into two-grain pills. *Tankanadi vati* contains the above ingredients with the addition of ginger and black pepper, all in equal parts. Another pill composed of borax, nitre, asafoetida. *Kantham,* (magnetic oxide of iron), purified iron pyrites, opium, garlic, kernel of bonduc seeds, all in equal parts powdered, ground in ginger-juice and turned into 2 or 2½ grain pills, is given in painful dyspepsia; a laxative of *triphala* should be given. A mixture of equal parts of borax, long pepper and baberang seeds is given for five days at the menstrual periods for the purpose of preventing conception. It is also used for procuring abortion and inducing labour pains. The following are some useful preparations containing borax:—(1) Take of borax, aconite, Alpotaxis auriculata, alum, long pepper, Embelia ribes, cloves, nutmeg and Helleborus niger. Mix and make a pill mass in honey. Dose is 2 to 5 grains, given with betel leaves, in cough. (2) Take of Borax, impure carbonate of potash, *trikatu, triphala,* Curcuma longa, *pancha lavana,* Cassia lanceolata powder, Embelia ribes and Aconitum heterophyllum equal parts and Balsamodendron mukul equal in weight to all. Mix and make a pill mass. Dose is 3 to 5 grains, given in milk or *Conjee;* useful in gonorrhoea, rheumatism, heart disease, epilepsy, hysteria etc. (3) Take of Borax 4, Pinus longifolia 3, black pepper 2, Anacylus pyrethrum 2, Datura seeds 3 and aconite 2 parts. Mix, add honey and make a pill mass. Dose is 5 grains, to be given in the juice of betel leaves, for asthma. (4) Take of Borax 2, *triphala,* dry ginger, long pepper, coriander seeds, cumin seeds, *sanchala* salt, each 1 part, cinnabar, Ferri peroxidum, sulphur, and black pepper each 2 parts and honey 5 parts. Mix and make a pill mass. Dose is 5 grains. Used in chronic bronchitis with profuse expectoration.

*Externally* borax is used in lotion (1 in 40 of water) in acne, freckles, chloasma etc., to allay itching in urticaria, psoriasis, pruritus pudendi, vulvi, scroti and ani, in gangrenous buboes, and sloughing ulcers. It is applied on rags well over the whole sore and renewed frequently by night and day. For dressing Delhi sores and other forms of ulcers, and

for stimulating them to healthy action a favourite application is an *ointment* made of a mixture of borax, sulphur and catechu, one drachm each in fine powder and an ounce of ghee. To sore nipples and in prickly heat and other forms of skin eruptions, a *solution* of borax (1 in 8) is applied before and after sucking the infant; or it may be employed in the form of ointment 1 in 8 of ghee. These applications are also serviceable in inflamed and painful piles. In the distressing irritation of the genital organs both in males and females, cloths saturated with a strong solution of borax (1 in 16) kept to the parts afford much relief. In the case of women, the solution should be used in the form of vaginal injection. The solution (1 in 5) proves very useful as injection in cystitis, leucorrhoea and gonorrhoea and in lithic acid deposits. In the treatment of vaginal leucorrhoea Rosch deposits in the fornix 0.5 gm. (7 or 8 grains) of boric acid at first daily and then three times a week. The course of treatment lasts from one to three weeks. For ringworm a solution of borax in distilled vinegar (1 in 16) is an effectual application. In aphthae or thrush and soreness of mouth or throat to parasitic stomatitis, to the urethra in urethritis, to cracked tongue, a mixture of one drachm of powdered borax and one ounce of honey or other suitable vehicle, is an excellent application, especially suitable to infants and young children; for this the official *Mel Boracis* and *Glycerinum Boracis* are efficient substitutes. It should be applied with the finger to the spot twice or thrice daily. In hoarseness of the throat to which songsters are liable it is locally applied with benefit. In ulceration of mouth, fissures or cracks in the tongue in adults, which occur in the advanced stages of consumption, fever, etc., an application twice the strength of the above proves highly serviceable. In mercurial salivation a solution of borax (1 in 16 of water) makes an excellent *gargle.* As a resolvant of enlarged glands and tumours, a *paste* made of equal parts of borax, alum and milk-curd is applied. *Boroglycerine* (1 in 45) is useful as an antiseptic lotion in purulent ophthalmia and diphtheria.

---

## 47. SODII SILICOFLUORIDUM

(Sodium Fluosilicate or Sodium Fluosilicas, Silicefluoride of Sodium, Sodium Silicofluoride) occurs in crystals or white granular powder without any odour or taste, soluble in water. It is non-irritant, disinfectant, antiseptic, germicide, (anthelmintic), deodorant and styptic. As an *injection* (2 p.c.) it is used in gonorrhoea; as a *mouth wash* or gargle in diphtheria and sore-throat; as a *solution* for carious teeth, wounds and for irrigating abscess and other cavities.

---

## 48. SODII CHLORIDUM IMPURA or SODIUM CHLORIDE IMPURA

(*Sans.*—Saindhava. *Eng.*—Rock-salt; Sea salt; Bay salt; Sodium chlorate. *Arab.*—Mil-he-tabazard. *Pers.*—Namake-sang. *Hind.*—Sendhalon; Sedhalon. *Duk.*—Sondanimak. *Guj.*—Sindhaluna. *Tel.*—Saindhalavanam. *Tam.*—Indu-uppu. *Can. Kon. & Mah.*—Sendhurlavana. *Mal.*—Intu-uppu. *Ger.*—Natrium chloricum).

Source.—Found in Nature in extensive beds mostly associated with clay and calcium sulphate. To obtain it, holes are dug into these rocks which soon become filled up with salt water; the water is evaporated and the salt is left ready for use.

Characters.—It is found in small white crystalline grains or transparent cubes. It is brownish white externally and white internally. It has a pure saline taste and burns with a yellow flame.

Action.—In small doses it is highly carminative, stomachic and digestive. It promotes the appetite and assists digestion and assimilation. In large doses (1 to 2 drachms) it is cathartic; in still larger doses (4 to 8 drachms) it is emetic. Rock salt possesses stronger purgative properties than cream of tartar; but like this it is not a satisfactory cathartic given alone. Combined with other purgatives it is equal, if not superior to it.

Uses.—It is given in dyspepsia and other abdominal disorders. To rouse digestion weakened by diarrhoea, rock-salt

and *Yavakshar* (alkali-Potassium carbonas impura) are given, in convalescence. When heated it is used to foment painful, swollen and such other parts. Rock salt with warm water is used as an emetic. A compound powder called *Vadavanal churna* containing rock salt, long pepper, *pipli*, cubebs, *chitrak*, ginger, and myrobalans in equal parts, mixed and made into a powder is used in anorexia, flatulence and biliousness. Dose is 5 to 15 grains two or three times a day with water. A medicinal salt called *Nariekelakshara* is highly recommended in Chakradatta as valuable in the form of dyspepsia which is attended with pain two or three hours after meals. It is thus prepared:—Take a cocoanut-fruit full of water, make a hole in it and fill the cocoanut with rock-salt and dissolve it in its water. Then close the opening, cover the nut with a layer of clay and roast it in a pit of fire. The salt thus roasted is given with the addition of long pepper. Dose is about a quarter tola. A *powder* made of rock salt 10 grains, *Kaladana* 1 drachm and dry ginger 10 grains is a good laxative, in a single dose. As a digestive, a *compound powder* made of rock salt, chebulic myrobalan, emblic myrobalan and long pepper in equal parts is recommended in doses of 10 grains twice a day. A powder containing *pancha lavana* 5 parts, impure oxide of iron 5 parts and emblic myrobalan 4 parts is useful in doses of 10 grains in dyspepsia, congested liver etc. A medicated oil named *Salpa Masha Taila* is used as an application in rheumatism, contracted knee joint, stiff shoulder joint etc.

---

## 49. SODII CHLORIDUM or SODIUM CHLORIDE

(*Sans.*—Lavana; Samudra Lavana; Dronilavana. *Eng.*—Common salt; Table salt; Muriate of Sodium; Muriate of Soda. *Arab.*—Milhuls-aajin. *Pers.*—Namake-khurdam. *Hind.*—Namak; Lun Nun. *Duk.*—Nimak. *Ben.*—Nimok; Lesu. *Guj.*—Mithun. *Bom. Mah. & Kon.*—Chemit Meeth. *Can.*—Droni-uppu; Kadluppu; Uppu. *Tel. Tam. & Mal.*—Uppu. *Burm.*—Themg-dan-hsa. *Sinh.*—Shih-yen; Lunu.)

Source.—Sodium chloride or salt is found in Nature forming 2.5 p.c. of the waters of the ocean. It is obtained by lixi-

viation of saline soil or by evaporation of brine springs or sea-water. When obtained from sea-water it is known as *Samudra lavana.*

Characters.—Salt occurs as transparent cubes or small brownish-white crystalline grains, odourless, of saline taste and neutral reaction, soluble in water, insoluble in alcohol and chloroform.

Action.—Antiseptic, antiperiodic, anthelmintic and de-obstruent. Common salt is an ingredient of our body and keeps the globulin of the blood in solution. We are continually losing it through sweat, wine, tears etc., *and therefore its want causes disease and even death.* It increases the secretion of the gastric juice and should therefore be taken with discretion by the dyspeptic. It should be taken with caution by stout persons, patients with dropsy and those suffering from excessive thirst and skin diseases. The salt of the sea water contains *a small proportion of iodine,* which renders it essential for the human being as a preventive of goitre and other glandular enlargements. Dr. Barclay, President of the British Radiological Society, Manchester, declares (Montreal Pharm. Jour.) that in communities near the sea there are few, if any cases, of goitre, and proves his theory from the fact that there is much less goitre in England than in the United States where the people are far from salt water. *He thereby proves that goitre is caused by insufficient iodine in the human system.* Internally in small doses it increases the secretion of the salivary and gastric glands, sharpens appetite and promotes digestion of vegetable food. It excites thirst and thus assists absorption of liquid food. In a diluted form it enters the blood and dissolves albumins and globulins. In a concentrated form it is an irritant to the cut surfaces to the mucous membranes, muscles and nerves. It is also a rubefacient. It decreases the secretion of mucus, promotes absorption of effused products. It is eliminated in the urine. In large doses *i.e.,* 2 to 4 drachms in solution, salt acts as an emetic, and in still larger doses it is a powerful purgative.

Uses.—Being one of the constituents of the blood and of the body generally, it forms an important dietetic agent and

is used as a condiment. Swami Lavanananda speaking of salt in its relation to longevity of life mentions eight civilized countries from British Isles and United States down to India and gives the national consumption of salt per head in comparison with their average longevity. He gives 72 and 48 lbs. of salt per head per year in British Isles and U.S.A. respectively, where the average length of life is 45 years, whereas in India it is only 23 years, owing, he says, to the fact that the average consumption of salt per head per year in India is only 12 lbs. He therefore preaches the value of saline nasal douche and salt-water drink to make us more healthy and the Government more wealthy through salt-tax. But in contrast to this view a book published by the Theosophical Publishing House, Adyar, Madras, and styled 'Salt—A Superstition' gives copious illustrations and extracts to prove the justification for its total discontinuance as an article of diet! It is mentioned that in Ayurvedic treatment a saltless diet is generally prescribed in diseases such as dropsy and that *Bhagvath Githa* refers to a salted diet as causing "pain, grief and disease." *At any rate, excessive and improper use of salt is not commendable.* In moderate doses it has a tonic effect, observed especially in some cases of convalescence where there is an intense craving for it. In fevers, dyspepsia and bilious diarrhoea in children it is given with benefit. A powder named *Vaishnavanar Churnam,* made up of common salt, *ajowan,* omum seeds, long pepper, ginger and chebulic myrobalan, is useful in doses of 20 to 60 grains twice a day, as gastric stimulant and carminative. For an attack of acute indigestion with difficulty to breathe a very simple remedy is to put a pinch of table salt, dry, on the tongue and while it is dissolving it is acting on the saliva very quickly and when this is swallowed it assists in the digestion of whatever article of food has remained undigested especially starchy foods. A contributor to the "Indian Medical Record" says with regard to the usefulness of salt in typhoid fever etc.:—"This saved my life when recovering from typhoid and I have told many persons of it and they have been helped; it acts better when dry than when dissolved in either hot or cold water and drunk, as then the salivary glands are not excited to activity".—(Health Hints in Indian

Medical Record, Nov. 1925). Biochemists in America have found from experiments made, that *salt serves the valuable function of reducing uric acid in the blood especially of those on a diet too rich in either proteins or carbo-hydrates. Sea water* collected from a depth of five fathoms far out in the Atlantic in sterile drums is being used for curative purposes in disease. It is said to work miracles in anaemia, gastric ulcer, catarrh, neuritis, neurasthenia, and all cases of debility. Experiments are now being made in America by Drs. Leaman & Gibson with some success in the treatment of vomiting with the administration of a 2 p.c. solution of sodium chloride. The relief was immediate, though transient. Also a few cases of duodenal ulcer with nausea and pain after meals, are reported to have been relieved though temporarily by giving a teaspoonful of salt dissolved in a glass of cold water. Dr. Brooke says that common salt is an efficacious remedy in malarial fevers, that only one dose or even two doses of the common salt are required to check an attack of any kind of malarial fever! He suggests the following mode of administration:—"A good handful of clean sodium chloride is first thrown on a well-washed frying pan which is being kept warm by the application of heat from underneath to drive off fully the water of crystallisation contained in the common salt. Such an application of heat is continued until the said salt took the brownish tint. Dosage:—For adults—one tablespoonful of this roasted salt which is equivalent to one ounce. This amount of salt after being well mixed with one glass of hot water should be taken in an empty stomach in the morning of the day before the date of an attack of fever. In quotidian type of malarial fever, after the remission or its cold stage being removed, it should be taken in an empty stomach. Not more than one ounce should be administered per mouth. But the dose should not be less than one ounce. *It would be of no effect if medicine is not taken in an empty stomach.* Consequently, the patient should not be given any food or even water before the medicine is administered. *Although the patient becomes very thirsty immediately after the medicine is taken, still he should not be given any other food except water.* This water should be slightly warmed and should be drunk at a time

in a drachm quantity off and on. If the patient becomes very hungry, he should not be given any other food except light diet *e.g.* chicken broth after 48 hours. *Within 24 hours after taking the salt water he should drink only little water off and on, otherwise he would derive no benefit at all. Regarding diet he should be very careful. Further he should remain careful as to cold exposure within 48 hours after the administration of medicine.* He should be instructed in such a way that he should wear always a warm coat and stockings. Dr. Brooke in his 18 years' experience in the medical practice did not get baffled in his object of curing patients after following the above principles. He was able to cure each patient by using this roasted salt after 48 hours. None had the relapse of fever. This medicine was rarely used twice in a patient. In Hungary, hundreds of patients are cured by adopting the above procedure. In hot countries of America nearly 400 Englishmen are attacked with malarial fever each year. None had the relapse of fever—(Practical Medicine, Sept. 1925). As a saline *intravenous injection* or enema it is given during collapse stage after operations and in uterine haemorrhages. In cholera, an intravenous injection of Rogers mixture is useful. It consists of sodium chloride 2 drachms, potassium chloride 6 grains and calcium chloride 4 grains in 1 pint of water. In plague cases accompanied by vomiting and purging Dr. H. C. Sen recommends *hypodermic injection* of normal salt solution. Surgeons make free use of intravenous or subcutaneous injection of salt water in critical times. The same or better result can be obtained by lay people by putting salt water in the body through nose or mouth. Marine-plasma or deep sea-water is used in France to improve the vitality of children. The same can be achieved by salt water drink. It is now admitted that saline *nasal douche* (salt water snuff) prevents influenza. It increases leucocytosis and improves vitality. We can prevent pneumonia and other chest disorders by salt water. It is not a very difficult task to give saline nasal douche to the child. Prepare a cup of salt water by dissolving powdered salt in the proportion of one tola to a seer of water or 6 grains of salt to an ounce of water. Put a few spoons in each nostril and a few in the mouth of the child. Dr. H. C.

Sen recommends administration of tepid normal salt solution freely by the mouth in every case of blood-poisoning or impoverished condition of the blood. He says that if it is not rejected by the stomach, *oral administration* should not be superseded by rectal, hypodermic or intravenous injections. As an *enema* it relieves flatulence and colic, destroys and brings away worms from the large bowels and prevents the paroxysmal attack of epilepsy. In neuralgic headache etc., it may be used as a *snuff*. It relieves haemoptysis and migraine. One per cent solution of it is a topical application to stop haemorrhages from wounds and a wash or a *sniff* in the cold and catarrh of the nostrils in ozoena and a *gargle* in chronic diseases of the pharynx and larynx. The sniffing of a little salt water every morning improves the health of children who do not breathe well. Salt is used as an antidote in poisoning by silver nitrate or after swallowing a leech. Heated salt is largely used as dry hot *fomentation* for the relief of painful joints and swollen scrofulous glands. About a pound of powdered common salt enclosed in a loose bag heated over a fire and applied for 20 to 30 minutes at a time relieves gastralgia or dyspeptic colic. Salt water (1 in 30) or *sea-bathing* is recommended for the cure of various skin affections, rheumatic and muscular pains and sprains etc. The following is recommended as a bath to soothe tired nerves:—"Dissolve four ounces of sea-salt in a quart of hot water and let stand until cool; pour 2 ounces each of spirits of ammonia and of spirits of camphor into 8 ounces of alcohol; add this to the sea-salted water and shake well. Wet the body all over with a sponge dipped in this mixture and rub vigorously till the flesh glows. The relief is almost magical. The worn feeling vanishes, a sleepy sensation creeps over the tired nerves and one sinks away into slumber sweetly."—(Practical Medicine. April 1926). "Salt water is the best thing for the daily cleansing of the teeth"—(Sir Harry Baldwin, Surgeon-Dentist to the King). When used as a preservative of animal substances such as meat etc., salt modifies the nutritive properties rendering it (meat etc.) less fit to nourish and sustain; hence *fresh meat is better than the meat preserved by salting.*

---

## 50. STANNIC SULPHIDUM

(*Sans.*—Svarnavanga. *Eng.*—Mosaic gold; Bisulphurette of tin) is a powder and a golden preparation of tin having a beautiful golden lustre and flaky texture. It is prepared thus:—Take equal parts of mercury, sulphur and tin-foils and rub them together; then take Sal ammoniac in quantity equal to all the above ingredients and rub these together in a mortar. Put the mixture in a glass bottle and heat in a sand bath. The resulting powder is the bisulphuret of tin. It is "used in complaints of generative organs, both in male and female. It is specially effective in gleet. It is indicated as a rejuvenator and tonic of high potency which induces health-vigour, improves the appetite, increases memory, generates semen of high quality, cures gonorrhoea, spermatorrhoea, leucorrhoea and allied troubles of the generative organs". Dose is 2 to 4 grains mixed with honey before use—(Kaviraj Bisharad & Dr. S. K. Mukherji—Jour. of Ayur., Sept., 1924). In impotency it is given as a rejuvenator with 4 grains of the powdered roots of Mimosa pudica. As an appetiser it is given with the water obtained by soaking 1 tola powder of Emblic myrobalans in 4 ounces of water soaked overnight and strained through a linen in the morning. For memory it is given with the fresh expressed leaf juice of Indian penny-wort. In gonorrhoea it is given with the juice of the raw turmeric or leaf-juice of glomerous fig tree (Ficus glomerata) or leaf-juice of *Himsagar (Pashanbhedi, Irrissp)*. In spermatorrhoea it is given with cubeb powder 12 grains. In leucorrhoea it is given in the decoction of red sandal wood (1 tola of powder in 8 ounces of water boiled down to 2 ounces). For thinness of semen, it is given as for impotency, or in the leaf-juice of *Aswagandha* or with powdered roots of Mimosa pudica—12 grains per dose or with decoction of the root bark.

---

## 51. PERMURIATE OF TIN (SNCL2)

(*Eng.*—Perchloride of tin).

---

## 52. STANNUM

*Sans.*—Vanga; Ranga; Trapu. *Eng.*—Tin; Pewter-calx. *Arab.*—Rasas; Abruz. *Pers.*—Urziz. *Hind.*—Kathal; Rang. *Ben.*—Banga. *Guj.*—Kalai. *Mah.*—Kaloi. *Duk.*—Kathil. *Tam.*—Tagaram. *Tel.*—Vendi; Sisam. *Mal.*—Kalang; Timah. *Can. & Kon.*—Tavaray. *Sinh.*—Sudu-iyam. *Burm.*—Khai-maphyn.

Source.—Rarely met with in a free state; found as oxide in native plates or tin stone or in combination with sulphur as sulphide. It is abundant in Burma, Tennaserim and Malacca.

Characters.—As met with in the bazaar tin is a bluish-white metal, silverlike, softer than gold, harder than lead, bending with a cracking sound, malleable but sparingly ductile with little elasticity. It is obtained by heating tin-stone with charcoal. In Ayurvedic works two varieties of tin have been described.—(1) Impure tin *(Misraka* meaning mixed), is dirty white in appearance. Arsenic and Sulphur are the chief impurities in tin ore. (2) Pure tin *(Kshuraka)*, white, soft, cold (to the touch), readily fusible and bright and does not clink when struck—(Rasaratnasamuchchaya). Only pure tin *(Kshuraka)* should be used in the preparation of medicines.

Purification.—Tin is purified by melting it over fire and pouring the melted fluid into the milky juice of Calotropis gigantea. Another process is to drop the molten tin into the juice of Vitex negundo mixed with turmeric: the process being repeated three times, the metal undergoes purification.—(Rasaratna-samuchchaya). For medicinal use it is prepared by melting purified tin in an iron cup adding to it one-fourth part of its weight of *Yavakshara* and powdered tamarind shells, agitating with an iron rod till the mass is reduced to a fine powder. It is then washed in cold water and dried over a gentle fire. Other methods consist in—(1) melting corrected tin in an earthen pot and adding to the molten metal, an equal weight of powdered turmeric and psychotis ajowan and cumin seeds and afterwards the ashes of the powdered bark of Tamarindus indica and Ficus religiosa and continuing stir-

ing over fire till the tin is reduced to ashes (powder), which is then washed to rid it of vegetable-ashes—(Rasendrasara-sangraha); or (2) smearing tin-foil with a paste of orpiment and the milky juice of Calotropis gigantea and then covering it with the ashes of the bark of Ficus religiosa and Tamarindus indica and roasting till reduced to ashes—(Rasaratna-samuchchaya). In this process orpiment plays an important part in the reduction. The best method of reducing tin is this:—Tin is melted over fire in an iron vessel. Powdered Achyranthus aspera plant is then added to the molten tin in the iron vessel and stirred continually with iron rod when it is reduced to fine powder, wash and put it in a covered crucible and burn repeatedly by the *putapaka* process in mild heat—(Kaviraj A. C. Bisharad & Dr. S. K. Mukerji M.B.). The resulting product is a greyish white powder consisting chemically of oxide of tin *(Vanga bhasma)* with some impurities.

Uses.—It is chiefly used in diseases of the genito-urinary organs, blood and lungs. Dose of the powder is 3 to 5 grains twice daily with honey or butter. In the West, oxide of tin has been advocated as a therapeutic agent in staphylococcal infection in the treatment of boils etc. In India it has been in use from a very ancient period in several diseases in a variety of forms. *Misrakam* (Impure tin) is useful in urinary disorders. In urinary diseases tin-oxide is recommended; it is usually combined with the juice of Ocimum sanctum leaves or with juice of betel leaves in cases of difficult micturition. In painful micturition a preparation called *Trinetra Rasa* is given with a decoction in milk made of the juice of Cynodon dactylon, liquorice root, gum of Bombax malabaricum, and Tribulus terrestris. It is prepared thus:—Take of prepared tin, mercury and sulphur equal parts, rub them together in an iron mortar and soak seven times respectively in the juice of Cynodon dactylon and the decoctions of liquorice root, gum of Bombax malabaricum and Tribulus terrestris. Then roast in a covered crucible, again soak in the above mentioned fluid medicines and make into four-grain pills. In gonorrhoea, Zad Garib prescribes a compound powder made of tin oxide, Bamboo manna, cubebs, coriander and cardamoms in equal parts. Dose is to begin with 1 *masha* (11 or 12 grains)

gradually increased up to 3 *mashas.* In diabetes *Vangeshwara Rasa* which consists of *Rasasindura* (red sulphide of mercury) and *Vanga bhasma* in equal parts is recommended. Dose is 4 grains taken once a day with honey. Well-known preparations of Tin, such as *Somanath Rasa, Basantakumara Rasa, Tarakeshvar Rasa, Gaganadi Lauha* etc., are recommended for diabetes. *Vanga blasma* with honey, turmeric and juice of the root of Bombax malabaricum is generally used. Another compound preparation recommended in Bhaisajyaratnavali for diabetes is *Vrihat Vangesvara Rasa.* It is given with the juice of the ripe fruit of Ficus glomerata. It acts as an alterative tonic and cures all sorts of urinary diseases. It contains prepared tin, mercury, silver and talc, sulphur and camphor each 2 tolas, prepared gold and pearls, each half a tola, mixed together and soaked in the juice of Eclipta prostrata and made into 4-grain pills. In spermatorrhoea tin oxide is given with nutmeg powder and ghee. In phthisis it is given with turmeric juice for haemoptysis. In asthma it is used with copper. In paralysis it is used with garlic juice. In general weakness Sharangadhara recommends it as a tonic and alterative. It "improves health, strengthens the organs and nourishes the whole body". In weakened vitality, sexual debility and impotence it is used with the leaf-juice of Achyranthus aspera. As an aphrodisiac it is best and combined with musk. For putrid smell in the mouth it is given with camphor. In dyspepsia it is given with either powdered long pepper or with juice of betel leaves. In constipation it is prescribed with betel leaf-juice. In jaundice it is used with clarified butter. In skin disease it is given with catechu dissolved in water. In leprosy also it is recommended and is prescribed with leaves of Vitex trifolia. Oxide of tin has given excellent results in acne vulgaris, anthrax and styes. It "is now used either as tables for oral administration or as solution in lipoid medium for injection"—(Jour. of Ayur., Sept. 1924).

## 53. SULPHUR

*Sans.*—Gandhaka. *Eng.*—Brimstone; Sublimed Sulphur. *Hind.*—Gandak; Gundhak. *Ben.*—Gandrak; Gandhak. *Kash. Guj. Mah. Kon. Duk. Can. & Sinh.*—Gandhak. *Tel. Tam. & Mal.*—Gendagum. *Tam.*—Gandakam. *Tel.*—Gandhakam. *Punj.*—Gandhak; Kibrit; Anwlasar; Gogird. *Arab.*—Kibrika. *Pers.*—Gowgird; Gangird. *Burm.*—Kau. *Malay.*—Balirang.

Sulphuric acid ($H_2SO_4$) is called in *Tam. Tel. & Can.*—Gandagadravakam. *Hind.*—Tezab.

Source.—A non-metallic element found free in beds of gypsum and in a state of sublimation in regions of extinct volcanoes; also in combination with several ores called pyrites, as sulphates and sulphides of iron, copper, lead, zinc, mercury etc. In India it occurs naturally in some parts, in Nepal, Kashmir, Afghanistan and in Burma. It is a constituent of various vegetable and animal substances such as albumen etc. It is obtained by roasting, fusion or by sublimation.

Characters.—As met in the bazaar, it is of four kinds:—(1) Yellow variety or vitreous or precipitated sulphur or *Amlasar gandhaka,* occurs in semi-transparent crystals resembling the translucent ripe fruits of the *Amalaki.* This is employed for internal use in combination with mercury. (2) The white variety known as roll sulphur is found in sticks about two inches in width and 3 to 5 inches long; the taste is bitter and astringent and the smell is nauseous. It is very brittle; it is somewhat sticky to touch. It being inferior to the yellow variety is preferred for external application. (3) The red variety is called *Rati Hirakasi* or *Lal gandhak;* it occurs in small, flat or irregular crystalline pieces of a shining orange-red, purple or brick dust colour. The taste is acrid and bitter. It burns with a faint blue flame and emits the smell of sulphur. (4) The black variety, i.e., Sublimed sulphur *(Gandhak-na-phul)* is a purified form of sulphur and is prepared by washing *Gandhaka* in milk. It is first dissolved in an iron ladle smeared with butter and then gradually poured into a basin of milk. When cool and solidified it is fit for use. It is a light yellow powder of a bitter astringent taste and of a peculiar smell. Dose is 12 to 24 grains with milk or other vehicle.

Action.—Sulphur is described as of bitter astringent taste with a peculiar strong smell. It increases bile, acts as a laxative and alterative and its preparations also act as alterative, laxative, diuretic and insecticide. Sulphur, when taken internally and in small doses, becomes absorbed and may be detected in the sweat, milk and urine. It is a stimulant to the secreting organs such as the skin and the bronchial mucous membranes. It has a specific action on the rectum and increases the haemorrhoidal secretions. The sulphurous and mineral waters as they contain earthy and alkaline sulphates act as laxative and diuretic, while the sulphurous acid disengaged from them acts as a diaphoretic. In large doses it acts as a purgative.

Uses.—In combination with mercury it is used in almost all diseases. It readily combines with and fixes metallic mercury and is therefore extensively used in combination with that metal. In combination with jaggery or cream of milk, sulphur is given in diseases like haemorrhoids, prolapsus and stricture, also in chronic skin diseases; in skin diseases sulphur is used both internally and externally. Internally it is given with milk or in the shape of a sulphurated butter, which is prepared from milk boiled with the addition of sulphur, then cooled and converted into curd which is after frequent churning converted into whey and butter; butter is next boiled when it becomes converted into oil; or it may be prepared by triturating sulphur in the juice of lemons and adding to it milk and boiling the whole and then allowing it to cool; an oily liquid will separate. This is called *Gandha taila* and is taken internally in doses of 1 to 2 minims and applied externally in skin diseases—(Sandeha Bhanjani). Sulphur and *Yavakshara* mixed with mustard oil is applied in pityriasis, psoriasis etc. In chronic skin diseases a confection of sulphur called *Gandhaka Rasayana* is used as an alterative. Dose is 1 to 2 drachms. *Gandhaka Rasayana* in doses of 10 grs. each, given every morning with honey, in cases of advanced leprosy, and in doses of 15 grs. each with hot water before every meal, in acute leprosy, has been beneficial. It is made thus:—Take of sulphur 2 parts and mercury 1 part; to this add the juice of aloe leaves and

triturate the whole to form a paste. Then heat it and when cool add honey and ghee each 2 parts. Sulphur enters into the composition of a large number of applications for skin diseases as, for example:—*Adityapaka taila* which is recommended by Chakradatta in eczema, scabies etc. It is prepared by taking madder, the three myrobalans, lac, turmeric, orpiment, realgar and sulphur in equal parts, in all one seer, mixing them with four seers of sesamum oil and exposing the whole to the sun. Sulphur is useful in cough, asthma, consumption and general debility; also in enlargement of the liver and spleen, chronic fevers etc. In chronic rheumatism, lameness, cough, asthma and skin diseases, a confection known as *Sinhanada guggula* is recommended by Chakradatta. It is prepared by taking sulphur and bdellium each 8 tolas, decoction of three myrobalans 72 tolas, and castor oil 32 tolas and mixing and boiling them together in an iron vessel till reduced to the consistence of a confection. Dose is one drachm twice daily. In constipation a thin paste called *Gandhaka kalka* is recommended; it is made of sulphur and chebulic myrobalans and butter each 1 part and juice of Eclipta 3 parts well mixed together and made into a paste. As sulphur is a mild laxative, for habitual constipation, in the presence of haemorrhoids, equal parts of sublimed sulphur and cream of tartar with a little honey or milk in doses of 1 drachm is taken before each meal. Dose is half to one teaspoonful once or twice daily. This also acts beneficially in cases of piles and chronic dysentery. There are certain Ayurvedic preparations containing sulphur, which are useful in asthma and other forms of "*Swasa*"; and the chief of these are:—*Swasa-kuthar Rasa* (see "Arsenic" & "Mercury"), *Swasa-Chintamani* and *Brihat-swasa Chintamani, Swasa kasa Chudamani, Maha Lakshmi-bilas* (see "Silver"), *Mrityunjaya Rasa* (see "Mercury"), *Suryavartha Rasa* (see "Copper"), *Maharaj Vati & Vijaya Vati.* In fevers also preparations like *Mrityunjaya Rasa* are used, especially in the *Vayu* type of remittent fever and that of typhoid. In worms and several blood parasites with constipation or with fever, cough and indigestion, vermifuge combinations such as *Kitamarda rasa* and *Krimimudgar rasa* containing *ajowan* and *vidanga,* besides sulphur etc. are recom-

mended. For *external* application in skin diseases sulphur *ointment* made up of powdered or sublimed sulphur 1 part and Kokum butter or any bland oil 6 parts, or better still so called *"balsam of sulphur"* which is simply a solution of sulphur in warm olive or sesamum oil is useful. A *sulphur bath* is generally efficacious for skin diseases, as itch, acne, rosacea, sycosis and chloasma and internally sulphur powder or mineral sulphurated waters are given with benefit. The sulphur bath is commonly made by adding the sublimed sulphur or *"milk of sulphur"* to boiling water and using it when sufficiently cool. "Sulphur baths of Vajreshwari near Kalyan in the Bombay Presidency are highly useful in the treatment of chronic muscular rheumatism, gout and cutaneous affections" —(Khory). In many households sulphur is used to disinfect rooms by fumigation. For ringworm Aksir-ul-Imraj recommends the use of a *paste* made of sulphur, sulphate of iron, borax, pitch-resin and lead carbonate in equal parts, for local application; and for scabies Ilaj-ul-Gurba recommends an ointment made of sulphur 4 *mashas*, seeds of Cassia tora 1 *seer*, cow's milk 1 *seer* and ghee 4 *chattaks*. In scabies and many other parasitic diseases of the skin, powdered sulphur in half *chattack* of bland oil is an efficient remedy. In cases of chronic rheumatism a *liniment* composed of two ounces of powdered or sublimed sulphur and a pint of neem oil well rubbed in, twice daily, is very beneficial. For rheumatic, scrofulous and other painful joints a plaster called *Gandhaka Lepa* made of sulphur triturated in the leaf-juice of Cassia fistula is useful. In cases of rheumatic joints, relief is obtained from dusting the affected part with flour of sulphur at bed time, enveloping it in flannel and covering the whole with plantain leaf to prevent the escape of the fumes. Antiparasitic and vermifuge pills such as *Krimighatini Gutika* are also useful. In worms and blood parasites with chronic fever and other troubles of gastro-intestinal tract, haematinic vermifuge such as *Vidanga Lauha* is recommended. A preparation called *Chaturmukha Rasa* (described under "mercury") is useful in phthisis, asthma, epilepsy and other nervous diseases. Dose is 1 to 4 pills of 1 grain each taken twice a day after food. "This was administered to a case of chronic bronchitis" which

was "cured"—(Ind. Drugs Report, Madras). For phthisis and chronic bronchitis with fever, *Rajmriganka Rasa* (described under "Plumbum") is also useful. For acidity and dyspepsia *Agnikumara Rasa* (see "Mica") is useful. In cholera a *paste* made of sulphur (precipitated) 5 parts, onion juice 3 parts, garlic juice 2 parts, mustard and Bishop's weed *(Ajwan-ka-phul)* each 4 parts, is given internally. For tympanitis, colic, ascites etc., a drastic purgative named *Mahanaracha Rasa* made of sulphur, mercury and black pepper 2 parts each, ginger 3 parts and purified croton seeds 8 parts, rubbed together for 12 hours and made into 2 grain pills, are given with cold water. After the operation of this medicine rice should be given with curdled milk and sugar. For dysentery *Vajrakapata Rasa* and *Gandhar Rasa* (described under "Mercury") and for chronic fevers with enlarged spleen *Jvarasani Rasa* (see "Mica") are recommended. For rheumatism and gout, *Sarveshvar Rasa* containing sulphur, mercury, copper, iron, cinnabar, etc., is used as an alterative. Dose is 2 to 4 grains. In meningitis and fevers complicated with cerebral symptoms, *Panchavaktra Rasa* containing purified mercury, aconite, sulphur, black pepper, borax and *dhatura* juice in equal parts, is administered. Dose is 4 grains. Along with these pills a decoction of the root of Calotropis gigantea with the addition of long pepper, black pepper and ginger is recommended to be taken. Sulphur is often an excellent intercurrent remedy in involuntary and too quick discharge of semen, in impotency, in weakness of black and threatening paralysis.

---

## 54. TALCUM PURIFICATION (Creta Gallica Purificata)

*Sans.*—Abhra. *Eng.*—Powdered Talc; Purified Talc; Muscovy glass; Mica; Glimmer; Purified French chalk. *Pers. & Duk.*—Talk. *Arab.*—Kabubul-ars. *Hind.*—Avrak. *Guj. & Mah.*—Hingool. *Tam.*—Appracam. *Sinh.*—Kin. *Can. & Kon.*—Bhinga.

There are four varieties.—White *(pinaka)*, red *(naga)*, yellow *(manduka)*, and black *(vajra)*, of these, the black

variety (*Vajrabhra, Krishnabhra* or *Sheabhra*) is used in medicine.

Source.—Chiefly found in mountains. In India it is found chiefly in the districts of Nellore and Hazaribagh and in the hills of the Central Provinces and Rajputana. It occurs in a natural state either as an essential constituent of igneous rocks or as a product of mineral silicates by weathering or contact.

Characters.—A kind of crystalline mineral, of a foliated texture capable of being divided into extremely thin flakes or leaves, having a sensible elasticity and a metallic lustre. The flakes are transparent, soft and can easily be scratched. When divided across, the plates seem rather to tear than break.

Constituents.—Mica is a rock forming mineral. It is a silicate of aluminium together with alkalies and basic hydrogen—(Jour. of Ayur. July 1924). It contains 4 to 6 p.c. of water existing as basic hydrogen or as hydroxyl replacing fluorine.

Purification & Preparations.—"Mica the layers of which can be easily separated (by knife) is preferred" (Rasaratna Samucchaya). It is purified by boiling it in the decoction of *Triphala* or of dried plums for a long time and roasting or calcining it over a fire alternately, soaking it in the juice of lemons till the scales are separated. The calcined scales are ultimately mixed with the paste of Amaranthus polygamus and finally dried. Or it is first heated and washed in milk. The plates are then separated and soaked in the juice of Amaranthus polygamus and *Kanjika* for eight days. Talc thus purified is reduced to powder by being rubbed with paddy within a thick piece of cloth, when the powdered talc passes through the pores of cloth in fine particles and is collected for use. Talc thus reduced to powder is called *Dhanyabhra.* It is hard, heavy, very fine, black and of saline earthy taste. It is prepared for medicinal use by being mixed with cow's urine and exposed to a high degree of heat within a closed crucible, repeated for a hundred times. Sometimes the process is repeated a thousand times. When this is the case the

preparation is called *Sahasraputi Abhra* and sold at high price. Some soak it in the juice of Calotropis gigantea instead of cow's urine, before calcining. It is of superior efficacy. Ayurvedists believe that burning and pulverising repeatedly of the minerals produce a "potency" or peculiar molecular change in these and add to the therapeutic value of the product. *Dhanyabhra* or Talc powder consists of Silicate of magnesia with iron in excess. *Abhra bhasma* is prepared by heating together *Dhanyabhra* 1 part and borax 2 parts and triturating the whole in milk and evaporating. It is generally given with *Lohabhasma*. Dose is 2 to 5 grains. *Abhra Kalka* (emulsion) is prepared by mixing together *Abhra bhasma*, emeblic myrobalan, ginger, pepper, long pepper and *Vavadinga* in equal parts, reducing the whole to a uniform mass and then adding honey. Dose is 10 to 40 grains.

Action.—Mica is a disinfectant to some extent, but is seldom used as such. According to Rosenheim and Ehrmann (Deut. Med. Woch, 20, Jan. 1910), aluminium silicate when taken into the stomach, reacts with the excess of hydrochloric acid in the gastric juice to form silicic acid and aluminium chloride, the latter acting as a protective to the gastric mucosa in a manner similar to bismuth. It will be interesting to see whether prepared mica which is also a silicate has any such in the stomach as it has always been found useful in acid dyspepsia and gastric ulcer, *e.g.*, *Vidyadharabhra*—(Jour. of Ayur., July 1924). Silicilic acid is present in various percentages from 0.81 p.c. down to a trace, in the muscle, liver, spleen, lymph and intercellular fluid and also found in the various excreta—urine, faeces and sweat. Mica being a silicate its action as a therapeutic agent can thus be surmised. Reduced mica is described in Ayurveda as a general tonic and alterative. It is said to stimulate metabolic activity of tissue cells generally. It is also used as aphrodisiac. Reduced mica removes the derangement of the *tridoshas* and establishes their equipoise. *Dhanyabhra* is tonic and aphrodisiac. Generally the preparations of Mica are astringent, tonic aphrodisiac and alterative. *Abhra Kalka* is alterative and restorative.

Uses.—*Abhra Bhasma* is given in anaemia, jaundice, chronic diarrhoea and dysentery, nervous debility, chronic

fever, enlarged spleen, urinary diseases, impotence etc.; also in dyspepsia, asthma, hectic fever, and consumption; and in cachexia due to long continued discharges from fistulae, abscesses, gonorrhoea, leucorrhoea etc., it may be given with honey and *pipali* with benefit. As an astringent it is largely used in diarrhoea, especially of nervous origin. As an alterative it is used in enlargement of glands. Dose is 2 to 6 grains generally with honey, twice a day. In phthisis or tuberculosis it is given in doses of 2 to 3 grains twice daily either with a little honey or with honey and some vehicle as the fresh juice of *Vasaka* or with the fresh juice of the ripe fruits of Cactus grandiflora. The mica supplies silica to the connective tissue cells and thus helps them to form defensive barrier around the tubercles or the pus-forming bacteria. In asthma, reduced mica is given with the juice of *Vasaka.* In intestinal worms, reduced mica is given with seeds of Embelia ribes and a teaspoonful of clarified butter. In cases of biliousness and jaundice it is prescribed with sugar and milk. In gonorrhoea, it is given with honey and powdered *peepul* and turmeric 12 grains per dose. In chronic spermatorrhoea, it is given with the juice of *gulancha* and cane sugar. In anemia and chlorosis, it is given in combination with iron (*Loha bhasma*); in scurvy it is administered with honey and lemon juice. In rheumatism reduced mica is given with a decoction prepared from ginger, root-bark of Aplotaxis auriculata, Clerodendron siphonanthus and Withania somnifera each ½ tola and water 8 ounces, reduced by boiling to 2 ounces, which is quite sufficient as an usual dose for an adult. In farunculosis and cancer, reduced mica is prescribed with Senevieria zeylanica. In piles, reduced mica is given with the peduncles of the ripe fruit of Semicarpus anacardium. *Abhraka Kalka* is given to improve digestion and in seminal debility. In chronic fever and enlarged spleen *Jvarasani Rasa* is recommended in Bhaisajyaratnavali. It is prepared thus:—Take of mercury, sulphur, rock salt, aconite and copper, one part each, prepared iron and talc, five parts each, rub together with the juice of Vitex negundo leaves, then add one part of black pepper and make into two-grain pills. They are administered with the juice of betel leaves. In chronic diarrhoea and indigestion the same recom-

mends *Agnikumara Rasa* and it is prepared thus.—Take of mercury, sulphur, borax, iron, aconite, ginger, long pepper, black pepper, *ajowan* and opium each one part, prepared talc ten parts, rub together for three hours with the decoction of Plumbago rosea and make into pills of the size of black peppers. In loss of appetite, disinclination for food, dyspepsia, vomiting, urinary diseases, anasarca and debility, *Sulachanamritabhra* is prescribed in Rasendrasarasangraha. It is thus prepared:—Take of prepared talc 3 tolas, rub it with 8 tolas each of the fresh juice or decoction of the following drugs, *viz.*, pulp of Ziziphus jujuba, Chavica officinarum, root of Andropogon muricatus, pomegranate fruit, lemon juice, emeblic myrobalan and Oxalis corniculata, and make into pills about 6 grains each. This is tonic, alterative and aphrodisiac. The preparation called *Kandarpa kumarabhra* is very similar to the above in composition. In convulsions, hemicrania and neuralgia, pills called *Lakshminarayen Rasa,* the chief ingredients of which are *Abhraka bhasma, Rasasindura,* aconite, *Katuki* and bark of Holarrhena antidysenterica, have been used. These were tried and found to be useful in reducing the temperature and causing diaphoresis in remittent and intermittent fevers. Dose is 1 to 3 pills every three hours during fever—(Ind. Drugs Report, Madras). In disorders of the urine, pills called *Harisankara Rasa* prepared by soaking prepared talc in the juice of emeblic myrobalans seven times in the course of a week and made into two-grain pills, is recommended in the same. The same prescribes for heart disease, pills called *Arjunabhra,* which are prepared by soaking some prepared talc in the juice of the bark of Terminalia arjuna seven times and dividing the mass into two-grain pills; *arjuna* bark being considered a specific for this complaint. In phthisis and chronic bronchitis, four-grain pills called *Sringarabhra* recommended in Sarakaumudi are used. They consist of prepared talc, purified sulphur, mercury, camphor and a number of stimulant, aromatic and expectorant vegetable drugs. Dose is one pill chewed with betel leaves and ginger followed by a little water and taken three or four times daily. The diet should consist of ghee, milk and broth. For asthma accompanied with fever *Brihat Chandramrita Rasa,* containing

mica and iron, mercury, sulphur, gold, copper, camphor and a number of vegetable drugs and prepared in honey, is recommended. In *Vayu-kapha* variety of "*Swasa*" with fever and phlegm in chest, *Jwarasani Lauha* or *Mahaswasaari Lauha* (described under "Ferrum") is given. The former contains besides mica and iron, mercury and sulphur, rock salt, aconite, copper, black pepper and Vitex negundo. Besides these there are other allied preparations containing Mica *viz., Jvarari abhra, Dameswer abhra, Brihat Kanchanabhra, Kalyansunder abhra* etc., which are useful in these complaints, under different conditions. For general debility, impotence etc., *Mahalakshmivilasa Rasa* (see "Argentum") is recommended. Another preparation of similar composition and called *Manmathabhra Rasa* is also used for the same complaints. Vishagbhushan Kaviraj A. C. Bisharad mentions (Jour. of Ayur. Aug. 1925) a case of paralysis of tongue in an old lady of 80 rendering her unable to utter a single word, and which was given up by her attending Doctor, rapidly cured by him under the treatment of *Lakshmibilas Rasa* internally and for external application in the whole region of the tongue and the throat, of the concentrated extract of the leaves of wild fig tree (*Audumbar*). *Lakshmibilas Rasa* is composed of reduced mica and sulphide of mercury 8 tolas each, camphor 4 tolas, seeds of Gmelina asiatica, of *datura,* of Cannabis indica, Ipomaeia digitata, Asparagus racemosus, roots of Sida spinosa and Sida cordifolia (yellow variety), seeds of Tribulus terrestris and Eugenia acutangula 2 tolas each, finely pulverised, well mixed and the whole soaked with the juice of betel leaves and rubbed well in a stone mortar for days together so as to reduce it to a pill-mass, which is divided into pills of 6 grains each, dried well and preserved in a glass-stoppered bottle. This medicine allays many serious and complicated conditions. In small-pox with high fever, delirium and severe pain in the sides etc., *Kastur bhusan* (described under Hydrargyrum) is administered with honey and paste of *Rudraksha.* In leprosy with ulceration of the toes and fingers, *Galithkusthuri Rasa* described in Bhavaprakash is given. It is made of prepared talc and the seeds of Pongamia glabra 4 parts each, mercury, sulphur, prepared copper and iron, bdellium, plumbago root,

*silajit*, nuxvomica and *triphala* each 1 part, rubbed together with honey and ghee and preserved in an earthen pot smeared with ghee. Dose is about a drachm. The diet should consist of fine rice, milk, sugar and honey. *The patient must live apart from his wife. Abhra bhasma* with iron, and *silajit* basmam prepared with a number of vegetable drugs added, has been extolled as a specific for diabetes mellitus. This has been referred to under *Silajit* (Asphalt) which see. Dr. Koman used *Abhra bhasma* (calcined 100 times), or *Sata-Putabhrakam* (i.e. the black ore containing impure mica, which is burnt down 100 times at a very high temperature, so as to form an atomised powder), in four cases of diabetes mellitus, in doses of 2 to 6 grains morning and evening (twice a day) with honey, say, half a teaspoonful before food. In all cases of diabetes mellitus he says there was a gradual diminution in the quantity of sugar eliminated in the urine and the patients gained strength.—(Ind. Drugs Report, Madras). The following additional remedies containing talc are useful in various complaints:—(1) *Abhraka bhasmam* 2 grains and *Triphala churnam* 20 grains mixed together, and divided into 12 doses, and each powder-dose given every 4 hours with plenty of honey, to patients suffering from diabetic abscess, have found great relief. (2) Take of *Abhraka bhasma* 2, *Para kajali* 2, Balsamodendron mukul 4, fecula of Cocculus cordifolia 8, and Tribulus terrestris 5 parts. Mix, then add the juice of Vitex negundo and Cocculus cordifolia. Macerate well, and dry. Dose is 2 to 4 grains with the decoction of long-pepper; used in rheumatism. (3) Take of *Abhraka bhasma* 3, sulphur 2, Croton seeds 2, borax 2 parts. Mix and triturate in the juice of Citrus limonum. Make a pill mass. Dose is 3 to 5 grains with rice *conjee*; used in intestinal worms, colic, etc. (4) Take of *Abhraka bhasma, Para kajali, Mandura* (Ferri peroxidum) equal parts. Mix and macerate the whole in the juice of Asparagus racemosus. Dry the paste over a sand bath. Dose is 1 to 3 grains with black pepper and sugarcandy; used in consumption, fevers, etc. The virtues of the *Sweta* or white variety of mica are highly extolled as being of greater efficacy in eye-diseases, so much so that a grain or two of this preparation taken daily for some length of time

is said to endow the blind with sight! The process of reducing white mica is thus:—Take 12 tolas of white mica and purify it by soaking in cow's urine for 7 days. Then having dried it, heat it in fire and gradually soak it in (1) *Mansha-Kshir* (milk of Euphorbia neriifolia); (2) *Bata-kshir* (milk of banian tree); (3) *Arka Kshir* (milk of Calotropis gigentea) seven times each. Then dry it and soak in vinegar for 40 days, after which it should be taken out and rubbed and pulverised. Mix this powder with ½ tola mercury (previously purified by treating with slaked lime) and flower of Acacia arabica 1 tola and rub till well mixed and prepare small cakes and again soak in vinegar in a stone mortar rubbing daily for three consecutive days. When it assumes the required consistency prepare into small cakes, dry them in the sun and burn in a covered crucible (*Gajaputa*). This process of soaking in vinegar and burning should be repeated thrice when the white mica is reduced. Then correct this in the usual process of *Amritikaran,* before it is ready for use. The following is the process for *Amritikaran* or final "vitalization"—The reduced powder 1 seer, cow's ghee 24 ounces and the decoction of the *Triphala* or the three myrobalans one and a half seer should be gently boiled together in an iron pot. When the watery portion is evaporated, let it cool. When dried and pulverised this becomes ready for use. Dose—½ to 2 grains daily with honey and the decoction of the three myrobalans.—(Jour. of Ayur.).

---

## 55. ZINCUM

*Sans.*—Yashada; Tuttinaga. *Eng.*—Spelter or impure commercial zinc; zinc-ore. *Hind*—Jasta. *Ben.*—Dasta. *Guj.*—Jasad. *Duk.*—Jas. *Tam.*—Tutanagam. *Tel.*—Tuttunagam. *Can.*—Sattu. *Mal.*—Nagam; Tambaga-putch. *Kon.*—Tambaku. *Chinese.*—Tutenague.

Source.—Never occurs free in Nature, but exists variously combined with elements to form salts. It exists combined with oxygen as red oxide, with carbon as an impure carbonate, with sulphur as sulphide or sulphuret (Blende) or with Silica

as silicate. It is obtained by subliming carbonate or oxide of zinc with charcoal.

Characters.—It is a bluish-white metal of a granulated crystalline structure with considerable lustre soluble in the weakest acids. It is ductile, malleable and can be drawn into wires or rolled into sheets. Melted zinc on cooling becomes brittle and may then be reduced to powder. The fused mass if dropped into water, forms granular zinc. Pure zinc becomes tarnished by exposure to air. When melted with copper it forms an alloy known as Brass.

Purification.—It is purified and reduced to powder in the same way as tin.

Action & Uses.—These are similar to those of *Vanga bhasma* or Tin powder. *Zinc bhasma* is useful in eye diseases, various forms of debility, urinary disorders, anaemia and asthma. "Zinc *Bhasmam* has a great reputation in Northern Circars as an effective remedy in cases of infantile biliary cirrhosis. The course of treatment usually to be adopted is as follows:—*Rasnadi Tailam* 1 oz:—a teaspoonful to be given with fresh ginger *swarasam* extracted as follows:—(1) Take fresh raw ginger, Gr. 30. Extract a teaspoonful of fresh juice by adding the required quantity of water. Add half a teaspoonful of honey. Give the powder made of Zinc *Bhasmam* Gr. 1 and *Anandabhairavi* Gr. 1 along with the *swarasam* thus prepared. Give the same powder in the evening with honey. After a week when the patient improves, give the *Tailam* and ginger *swarasam* every alternate day only continuing the powder morning and evening, with honey".—(Dr. A. Lakshmi Pathi).

---

## 56. ZINCI CARBONAS

(*Sans.*—Kharpara; Rasaka; Kharpara-tuttha. *Eng.*—Calamine; Carbonate of zinc; Zinc subcarbonate; Zinc carbonate. *Hind.*—Kala khaparo. *Guj.*—Khapario. *Bom.*—Sang-i-basari) is prepared by calcining native Calamine (zinc sulphate and carbonate) and reducing it to powder. It is an impalpable powder; found in the bazaar as a fine, greyish-black and porous

earthy mass, composed of agglutinated granules, very brittle, odorless, tasteless, insoluble in water, soluble in dilute sulphuric acid with effervescence. In shape it resembles pieces of broken white clay-pipes. Chemically it was found to consist of carbonate and silicate of zinc with traces of other metals as iron, baryta etc. It is used as a dusting powder. *Kharpara bhasma* is prepared by taking equal parts of Calamine, lac, turmeric, *haradan, ral* and borax, finely powdering them and then heating the mass over a fire till reduced to ashes. Dose is ½ to 2 grains. A compound *kharpara* powder or *Jvararasa* or *bang-i-rasa* is prepared by taking Calamine, prepared mercury, orpiment, copper sulphate, borax and sulphur equal parts and reducing them to powder. Dose is ¼ to 1 grain. *Karpara Añjana* is prepared by adding calamine to decoction of *triphala* and stirring and then adding sulphate of copper, rock salt and borax, mixing well, drying over a sand bath, and adding when dry, one-tenth part of powdered camphor and mixing intimately. It is used as a collyrium in eye diseases. Vaidyas use calamine as a nervine tonic and alterative like oxide or carbonate of zinc. The compound powder is used in syphilis, scrofula, skin-diseases, etc. Calamine is one of the chief ingredients in the preparation known as *Suvarna Vasanta Malti* (see under "Aurum") which is used with honey and long pepper, in chronic fever, gonorrhoea, leucorrhoea etc. As an *ointment* or as *dusting powder* it is soothing, protective and astringent, used as an application to abrasions and to inflamed skin; it is used as a lotion with mercuric bichloride (one-sixth grain to each ounce of lotion) for eczema and acne.

---

## 57. ZINCI OXIDUM; ZINC OXIDE

*(Eng.*—White zinc; flowers of zinc. *Pers.*—Tutia; Jist. *Hind.*—Putty. *Guj.*—Jasata bhasma; Jasata-na-phula) is a soft, white, tasteless and inodorous powder, changing to pale yellow by heat. It is prepared by oxidising and roasting carbonate of zinc. It is insoluble in water, soluble without effervescence in dilute acids and in ammonia water. It is externally mild, soothing, astringent and desiccant. It is *dusted* over

as powder in eczema, impetigo, excoriations, bed-sores and cracked nipples, or applied as *ointment* to wounds, burns, vesicular eczema, chronic skin diseases etc. *Internally* it acts as a nervine tonic, sedative antispasmodic and astringent. It has a specific control over epilepsy, cholera and other spasmodic diseases as whooping cough, asthma, hysteria, dipsomania etc. It is a good remedy to check profuse sweating. For its astringent property it is given in bronchorrhea, and in colliquative sweats of phthisis. Dose is 2 to 6 grains. A preparation called *Tutanag pashan* is given in gonorrhea, leucorrhoea and spermatorrhoea with benefit. With *Jatamansi* it is given in epilepsy with good results.

---

## 58. ZINCI SULPHAS

(*Eng.*—Sulphate of zinc; zinc sulphate; White Vitriol; White Copperas. *Pers.*—Suffed)

---

THE

# INDIAN MATERIA MEDICA

## PART III

---

## ANIMAL KINGDOM

---

### 1. ACHATINA FULICA

(*Eng.*—Land snail. *Bom.*—Nakhala). Shell is used for preparing medicated oil.

---

### 2. *ACIPENSER HUSO LINN. or A. STELLATUS

(Class—Pisces:—Fishes).

*Eng.*—Sturgeon's air bag or Swimming bladder; Isinglass or Ichthyocolla prepared from it. *Bom.*—Aisinglasa. *Arab.*—Gerius Samak. *Hind. & Duk.*—Machhika-Siras. *Pers.*—Serasham-e-Mahi. *Tam.*—Minvajaram. *Tel.*—Cheppu vajaram. *Malay.*—Palog-pongikan; Ari-ikan.

Japanese or Chinese isinglass is known as Agar Agar.

*Aci—swift. Pinna—wing or fin. Huso—A bladder from Huyzen blas. The swimming bladder is so called as by its expansion and contraction these fishes swim. It contains oxygen and nitrogen.

Parts used.—The swimming bladder or sound found in front of the abdomen of several species of Sturgeons prepared and cut into fine shreds called Isinglass. American isinglass obtained from Gadus Marluccius (Hakefish) and from Otolithus regalis (weak-fish) occurs in thin sheets or ribbons.

Characters.—It is white, inodorous and very light. It is a kind of gelatin, but it is insoluble in cold water. An aqueous solution of 1 in 32 of boiling water forms on cooling a good, transparent, hard jelly.

Constituents.—In composition it is similar to albumen; it contains pure gelatin, an insoluble membrane 5 to 30 per cent and ash 0.5 per cent. It is a constituent of animal tissue, chiefly of bones.

Action & Uses.—It is highly nutritious, demulcent and emollient. Mixed with starchy food and with soups it is given in chronic diarrhoea in children and for invalids. As an emollient a *plaster* of isinglass, made of isinglass 10, alcohol 40, glycerin 1 part and hot water, is applied on one side of the cloth for cuts and abrasions.

*Animal gelatin* is obtained from gelatinous tissues such as skin, tendons, ligaments, cartilages of bones etc. It is prepared by boiling these tissues in water and drying the resulting jelly in the air; it forms translucent sheets, layers or shreds. It dissolves in hot water and solidifies into a jelly on cooling; it is insoluble in alcohol or ether. It contains carbon 50 p.c., nitrogen 18, hydrogen 7, oxygen 24 and sulphur 0.5 p.c. It is used as Calf's feet jelly; it is a basis for suppositories, pessaries, pills. lozenges etc.

*Chondrin* is obtained from the cartilages of the ribs and other non-ossifying cartilages and is analogous to gelatin. It is used as emollient, nutritive and protective. The watery solution of its jelly is precipitated by alum acetate of lead, ferric salts, acetic and mineral acids but not by tannin and mercuric chloride.

---

## 3. ACRIDOTHERES GINGINIANUS

Lath., is a bird; (*Eng.*—Bank-Myna. *Sans.*—Atipakshi; Saral-pakhi. *Ben.*—Gang-salik; Ramsalik. *Bom.*—Bagalipakshina). Flesh is beneficial in 'vitiated wind and cough'. Action:—Cardiac and stimulant.

---

## 4. ADEPS

**(N. O.:—Sus serofa; Family:—Suidae).**

*Eng.*—Lard; purified internal fat of the hog. Indian Bazaars.—Charbee.

*Source.*—Fresh fat of the abdomen of the pig, especially the fat over the mesentery, omentum and kidneys of blood and its external membranes.

Preparation & Purification.—It is first exposed to the air, then cut into thin slices, beaten in a mortar and reduced to a uniform mass. It is then put into a vessel surrounded by water and heated till the fat melts and separates from the membranous matter; it is then strained. To remove the nauseous odour, alum 15 grains and common salt 30 grains is added to every pound of the lard.

Characters.—It is a soft white unctuous mass of a faint odour, bland taste and neutral reaction. It dissolves entirely in ether, benzin and bisulphide of carbon.

Constituents.—Olein about 60 per cent, and palmitin, margarin, and stearin total about 40 per cent.

Uses.—It is used for preparing benzoated lard which contains lard incorporated in benzin powder 3 p.c. and which is employed for preparing ointments. Lard oil *(Oleum Adepis)* is obtained by expressing the fixed oil from lard at a low temperature when the stearin becomes separated from the olein; it is often adulterated with cotton oil and paraffin oil. Sometimes it is used in the preparation of nitrate of mercury ointment.

---

## 5. ADEPS LANAE

(N. O.:—Ovisaries; Family:—Bovidae).

*(Eng.*—Anhydrous wool fat) is a purified cholesterin—fat of sheep's wool; also found in human skin, hair, feathers of fowls and various parts of other animals. For further particulars see B. P. & Extra Pharmacopoeia.

---

## 6. ADEPS LANAE HYDROSUS

*(Eng.*—Hydrous wool fat; lanolin; agnin) is a yellowish white unctuous mass. It is not miscible with glycerin, but

miscible with water. It contains lanolin, cholesterin, palmitic, stearic, oleic, and valerianic acids and ash. It is emollient; has a great affinity for the skin. It is better for ointments if mixed with an equal part of soft paraffin. It is a good application for excoriation of the mouth, nose, anus etc., also for burns and scalds. For further uses etc., see B.P. and Extra Pharmacopoeia.

---

## 7. AEGITHINA TIPHIA, Linn.

(*Eng.* Common-Iora). See Clamator jacobinus, Bodd.

---

## 8. AGAMA AGILIS

See:—Lacerta agilis.

---

## 9. ALBUMEN

See:—Gallus Bankiva.

---

## 10. ALECTORIS GRAEA, Meisner

(*Sans.*—Upachakra. *Ben.*—Chakor). Flesh is astringent, generative of strength and stomachic.

---

## 11. AMBRA GRASEA

(*Sans.*—Amber-Sugandah. *Eng.*—Ambergris. *Arab. Hind. Ben. Bom. Mah. & Kon.*—Amber. *Pers.*—Mushk-amper; Shahabula. *Guj.*—Ambara. *Tam.*—Minumber. *Sinh.*—Mus Sumbra. *Burm.*—Payen-anbhat) is a morbid excretion contained in the intestines or caecum of the sperm-whale. It is in the form of a concrete mass found floating on the Red Sea or cast on the shores of Africa. A single whale's excretion has been found to weigh 750 lbs. It is opaque, seldom white, often darkish brown, ashy-coloured or grey or of a pink colour. The

odour is peculiarly fragrant, resembling that of musk; it is nearly tasteless. It melts in hot water, but not in cold; soluble in ether, fats, volatile oils and hot alcohol. It contains ambrein 85 per cent, a little of balsamic extractive and ash. It is stimulant, antiseptic, and antispasmodic; used in general weakness, epilepsy, spasms and nervous debility; also given in high fevers with insensibility or delirium and in the collapse stage of cholera, plage and other infectious diseases. Dose is 5 to 15 grains; used as a confection. Used for mixing with perfumes.

---

## 12. ANABAS SCANDENS, Daldorf.

See—Fishes.

---

## 13. ANIMAL FLESH

Sanskrit writers divide flesh into two classes, namely *Jangla* or land, and *Anupa* or water animals:—*Anupa mansa* (flesh of *Anupa* animals) is said to be "sweet, soothing, heavy of digestion, demulcent, fattening, checking appetite, phlegmatic, excitive of wind (*vata*) and generative of flesh"—(N. N. Sen Gupta). Animals living on land are sub-divided into eight orders as follows:—*Jangla* or animals living in the wilderness as deer, antelopes etc. The meat of *Jangla* animals is broadly speaking sweet and astringent causing slight constipation. It is light, easy of digestion, strengthening and appetizing, checking *tridosha* and increasing vitality.

*Vilastha,* or animals living in holes underground as serpents, lizards, porcupines etc.—Meat of such animals checks *Vayu,* is sweet to taste, heaty, increases *pitta,* is strengthening, lessens excretion of urine and faeces. *Guhasaya* or animals living in caverns, as tigers, lions, bears, etc.—Meat of such animals checks *Vayu,* is difficult of digestion, strengthening, somewhat good for those suffering from eye and rectal diseases. *Parnamriga* or animals living on trees, as monkeys, squirrels, etc.—Meat of such animals stimulates vitality, is good for eyes,

promotes flow of urine and faeces and is good in certain respiratory diseases and piles. *Vishkira* or birds which take their food after tearing or scattering it, as fowls, peacocks, quails, partridges, etc.—Meat of such birds is sweet and astringent, cooling, easy of digestion, strengthening, checks *tridoshas* and is very good. *Pratuda* or birds which strike with their beaks, as pigeons, wag-tails, cuckoos, etc.—Meat of such birds is similar to those of *Vishkira,* except that it increases *Vayu,* but checks *Kapha* and *Pitta. Prasaha* or birds of prey, as the hawk, falcon etc.—The meat of such birds is very heaty, deranges *pitta,* induces acidity and diseases like ulcers and sinuses, general weakness and even insanity. *Gramya* or domestic animals, as ox, goat, horse, sheep, etc.—The meat of such animals relieves flatulence, produces *kapha* and *pitta,* nourishes, is sweet in taste, non-acidifying in reaction, stimulating and enhancing metabolism—(Susruta).

Animals living in water or marshy lands are subdivided into five classes as follows:—*Kulechara,* or animals grazing in marshes, as buffalo, yak, rhinoceros, etc.—Meat of such animals checks *vayu* and *pitta,* is strengthening, vitalising, sweet, cooling and soothing, increases *kapha* and promotes urinary secretion. *Plava,* or birds which swim in water, as geese, ducks, cranes, etc.—Meat of such birds checks *pitta,* is soothing, heavy of digestion but cooling, stimulates secretion of faeces, strengthening and vitalising, increases *Vayu* and *Kapha. Kosastha,* or animals enclosed in shells, as conch-shells, bivalve-shells, etc.—Meat of such animals is sweet and soothing, cooling, strengthening, vitalising, increases faecal refuse, checks *Vayu & Pitta. Padina,* or footed aquatic animals as tortoise, crocodile etc.—Meat of such animals is similar to that of *Kosastha. Matsya,* or fishes:—Meat of fish is soothing, but heating after digestion, increases *Kapha* and *Pitta* and checks *Vayu.* It is strengthening, vitalising and palatable and is specially soothing to alcoholics, good for sensuous individuals having strong digestion.

Of these classes, *Jangla* and *Vishkira* are considered superior to the others in an alimentary point of view. Flesh of the goat, domestic fowl (*Gallus domesticus*—flesh is

stimulant, demulcent, cardiac stimulant, nutritious and generative of semen; beneficial in disturbance of the three humours, phthisis, vomiting and remittent fever), peacock and partridge is easily digested and suited to the sick and convalescent. The flesh of the francoline (see—*Francolinus pondicerianus*), partridge *(Titir)*. Flesh of the white variety is astringent, refrigerant, demulcent, easily digestible, constipating, cardiac stimulant; used to improve memory, alleviative of the *Tridoshas*. Beneficial in cough, phthisis, fever, epistaxis and hiccup. (N.N. Sen Gupta). Pigeon's flesh is demulcent, tonic, cardiac, nutritious. Used in constipation, beneficial in phlegm, bile, vitiated blood and wind, leprosy, and is prohibited in jaundice. Flesh of peacock *(Nila-mayura)* is "excitive of wind, cardiac, tonic, generative of memory, beneficial in the diseases of wind, ear-diseases and eye-diseases. The egg is sweet, cardiac and highly beneficial in loss of semen, heart-diseases and ulcers".—(N. N. Sen Gupta). Soup made from birds' meat (white meat) or from meat of deer is a diet in chronic cases of enlarged liver and spleen. Meat soup of deer and other wild animals (to replace the tissue waste, e.g., albumen in the discharge) is a diet for fistula in ano, when there is no fever. Meat of the deer, sambar, hare, quail and partridge is recommended for habitual use. Fish, beef and pork are considered hard to digest and unsuited for daily use. "Beef is very heavy and difficult of digestion, is soothing but excites *Pitta* and *Kapha,* checks *Vayu,* is strengthening, good in cough, chronic wasting fevers, disease of the nose, catarrh, phthisis, dyspepsia where there is a morbid craving for food, very suitable food for people of active habits and not suitable in any other season except winter.—(Charaka). From the above it is evident that the ancient Hindus used to take beef when they came from Central Asia. (Dr. Ashutosh Roy in the Journal of Ayurveda, Feb. 1926).

Flesh of various animals is used in medicine chiefly in the form of *ghrita* or *taila paka*. Following is a list of the more important and commonly used *ghritas* and oils made with the flesh of different animals:—*Hansadi ghrita,* prepared with the flesh of geese, and used in cephalalgia and nervous diseases.

*Kukkutadi ghrita,* prepared with the flesh of fowls, and used in chronic cough. *Siva ghrita,* prepared with jackal's flesh and used in insanity. *Chagaladi* or *Chagaladya ghrita,* prepared with goat's meat and used in nervous diseases. *Meat soup* is contra-indicated after *"Pitta"* or *"Vayu-Pitta"* causing diarrhoea. When indicated, the meat recommended is that of game birds like partridge, *"Lava", "Gonshi"* and wild animals like deer and rabbit. *Meat-juice* is advised for diet in *"vayu"* variety and *"kapha"* variety of *"Arsa"* (piles). Meat-soup of *jungly* animals is a diet in piles. *Sambukadi taila* is an oil prepared with the flesh of snails and used externally in ear diseases. *Nakuladya ghrita* is prepared with the flesh of mongoose and used in nervous diseases.

The following are two illustrations of preparations with animal flesh:—*Chagaladya ghrita:* Take of goat's meat (see Capra-aegagrus, i.e., goat whose flesh is nourishing, cardiac and stimulant) $6\frac{1}{4}$ *seers,* the ten drugs called *dasamula* $6\frac{1}{4}$ *seers* in all, water 64 *seers;* boil till the latter is reduced to one-fourth and strain. Take of clarified butter, milk and the juice of Asparagus racemosus 4 *seers* each; and the following substances in the form of a paste, namely, Tinospora cordifolia, bamboo manna, Withania somnifera, Hemidesmus indicus, berries called *kakoli,* bulbs called *kshirakakoli,* pulse of Phaseolus trilobus, and of Glycine debilis, Caelogyne ovalis *(jivanti),* and liquorice root, 1 *seer* in all; boil them together and prepare a *ghrita.* This preparation is given in facial paralysis, deafness, loss of voice or indistinct speech, convulsions, hysteria, sciatica, paralysis and other diseases of the nervous system. *Masha taila:*—Take of goat's meat 8 *seers,* water 64 *seers;* boil together till the latter is reduced to 16 *seers.* Take of the pulse of Phaseolus roxburghii, linseed, barley, root of Barleria prionites, and of Solanum jacquinii, Tribulus terrestris, bark of Calosanthes indica, jatamansi root, seeds of Mucuna pruriens, each 1 *seer,* water 64 *seers;* boil down to 16 *seers.* Take of cotton seeds, seeds of Crotolaria juncea, pulse of Dolichos uniflorus, dried pulp of Ziziphus jujuba, each 2 *seers,* water 64 *seers;* boil down to 16 seers. Take of ginger, long pepper, dill seeds, root of Ricinus communis, of Boer-

haavia diffusa, Poederia foetida, Vanda roxburghii, Sida cordifolia, Tinospora cordifolia, and Picrorrhiza kurroa, equal parts in all 1 *seer,* and reduce them to a paste. Boil the abovementioned decoctions and the paste with 4 *seers* of sesamum oil in the usual way. This oil is rubbed externally in convulsions, paralysis, wasting of limbs and other diseases of the nervous system.—(Bhaishajyaratnavali). Testicles of a sheep or goat are boiled in cow's milk and sugar, prepared as *Payasam* or *Halwa,* and given internally increases man's virility.—(Vatsyayana's Kamasastra). A man who eats sesamum seeds prepared again and again in milk and cooked with the testicles of a goat, or the two testicles of a goat prepared with ghee and milk, together with salt and molasses, increases virility in him.—(Ratirahasya).

---

## 14. ANSER INDICUS, Lath.

(*Eng.*—Gander or Drake. *Sans.*—Hansa. *Ben.*—Hans. *Bom.*—Ballaki). Flesh is stimulant, difficult to digest, demulcent, nutrient, phlegmatic, corrective of voice, alleviative of '*vayu*'. Egg is stimulant, easily digestible, cardiac stimulant and aphrodisiac. Flesh and eggs are beneficial in cough, heart disease and ulcers.

---

## 15. ANTIGONE ANTIGONE, Linn.

(*Eng.*—Indian Crane. *Sans.*—Sarasa. *Ben.*—Saras). Flesh is beneficial in diarrhoea and piles. Action:—Flesh is difficult to digest and antibilious.

---

## 16. ANTILOPE CERVICAPRA, Linn.

(*Eng.*—Indian antelope or Black Buck. *Sans.*—Enamriga. *Hind.*—Farisail Harin). Flesh is astringent and stomachic. Flesh is useful in fever, ulcers, phthisis, piles, jaundice and cough.

---

## 17. APIS MELLIFICA

A. indica; A. dorsata; A. florea, etc.—see also Mel. *Family:*—Apidae—the hives or the honey bees belonging to Hymenoptera class, are found in most parts of the Globe. There are two medicinal products prepared by the bee. These are:—*Mel* or *honey,* a saccharine secretion deposited by the insect in the honey comb; and *Cera* or *wax;* (which see under their respective heads).

---

## 18. ARDEOLA GRAYII, Sykee

(*Eng.*—Heron. *Sans.*—Krauncha. *Ben.*—Konch Bak). Flesh is used in fever, phthisis, cough, oedema, loss of appetite, swoon and stone in the bladder.

---

## 19. ARLUS ARIUS, Ham. & Buch.

(*Eng.*—Fish. *Sans.*—Ari-matsya. *Ben.*—Armach). Action. —Demulcent, cardiac and stimulant. Flesh is difficult to digest; improves memory, wind and phlegm.

---

## 20. ATHENE BRAMA INDICA

(*Eng.*—Owl. *Sans.*—Ulooka. *Ben.*—Pechak). Flesh is stimulant, produces '*vayu*', cholagogue. Useful in oedema, insanity and loss of semen.

---

## 21. BALAENA

(*Eng.*—Whale. *Sans. & Ben.*—Timi). Flesh is stimulant, demulcent, difficult to digest, (constipating); induces dyspepsia, and phlegm, and is a cardiac stimulant and carminative.

---

## 22. BEZOAR

(*Eng.*—Serpent stone; gall-stone. *Pers.*—Hajaratalbaqr; Gaorohan. *Hind. Ben. Mah.* and *Guj*—Gorochan. *Tel.*—

Gorochanamu. *Tam.*—Gorochana) is a concretion found in the stomach and in the gall-bladder of an ox or cow and occurs as light, yellowish or green, solid or spherical concretions. In Hindu medicine it is highly prized and extensively used. Dose is 1/6th to 1/4th grain. It is cooling, and aromatic. Prescribed in miscarriage. Artificial bezoar is a substance made up of ox gall mixed with hair, wood, magnesia, phosphate of lime, pipe clay, etc. For further information see Fel Bovis.

---

## 23. BIVALVE SHEL, belonging to Mollusca class

(*Sans*—Sukhali. *Eng.*—Chhip. *Guj.*—Chhipa) is a hard, transparent, brilliant substance consisting of two halves joined together, as in oyster-shells, of colour varying from white, red or yellow to black. The shape is rhomboid and fan-like. Each valve has its upper surface convex and under surface concave. A preparation known as *Chhipa bhasma* (Chhip powder, purified) is prepared like *Cowri bhasma;* its action and uses are similar to those of *Cowri bhasma.* A *paste* made of *Chhipa bhasma* 5, bisulphuret and trisulphuret of arsenic each 4 parts and *Sajjikhara* 6 parts, is applied as a depilatory to remove hair.

---

## 24. BOMBYX MORI, Moth. & B. Mylitta

(*Eng.*—Silk-pod; raw silk cocoon; silk worm-moth. *Ger.*—Serikos. *Arab.*—Abre-shama. *Ben.*—Pat. *Duk.*—Reshm-ki-keedi. *Guj.*—Resham-na-potan. *Mah.* & *Kon.*—Reshmi-chikeed. *Tam.*—Putloo puchie. *Tel.*—Puttoo purughu; Narputtio. *Can.*—Reshmi-hula). The former are the worms which feed on the leaves of Morus *(Shetura).* Those who feed on the leaves of Rhamnus jujuba are known as Bombyx mylitta. The cocoons or oval sacs are coverings spun by a group of silk moths during their metamorphosis. Each moth is about an inch long, half inch thick. Internally the sac contains dark-brown dried remains of a caterpillar. The cocoon-ash is the preparation used in medicine. Dose is 3 to 10 grains. It is used as a styptic, tonic and astringent, to check profuse menstruation,

leucorrhoea and chronic diarrhoea. It is generally given in combination with other astringents. The silk-pod is regarded as an aphrodisiac, generally used in confection for eye diseases and catarrh.

---

## 25. BOS BUBALUS, Linn.

(*Eng.*—Buffalo. *Sans.*—Mahisha. *Hind.*—Bhais. *Ben.*—Mahish. *Tam.*—Dumaputu). Flesh is stimulant, demulcent, difficult to digest, cardiac-stimulant. Milk is refrigerant, difficult to digest, demulcent, cardiac-stimulant, aphrodisiac, phlegmatic and hypnotic.

---

## 26. BOS TAURUS, Linn.

(*Sans.*—Gau; Go; Gabhi. *Eng.*—Ox or Cow. *Hind. Guj. Mah. and Kon.*—Bail or Gai. *Ben.*—Van; Go; Goru. *Arab.*—Bakana. *Burm.*—Niva; Pyoung. *Tam.*—Mada. *Can.*—Etthhu; Dana) is an animal found in all parts of the world. Different parts of this animal are used in medicine, viz.: Fel Bovis; Fel Bovinum Purificatum; Lactus, etc., which see under their respective heads. Fresh cowdung laved on the burnt parts alleviates the pain of burns and wounds; applied to a cut or a bruise, it stops the bleeding and heals the wound. In cases of pains in consequence of falls or wounds, plasters made of fresh cowdung heated on fire are applied with much benefit.

---

## 27. BUFO MELANOSTICUS

See:—RANA TIGRINA.

---

## 28. CAMELUS DROMODARIUS, Linn.

(*Eng.*—Camel. *Sans.*—Ustra. *Hind.*—Ur. *Ben.*—Ut). For action and uses of Milk, Ghee, Urine, etc., see the respective sections.

---

## 29. CAPRA-AEGAGRUS, Gmelin

(*Eng.*—Goat). See—Animal Flesh; Lactus; etc., Sections, for action, uses, etc.

---

## 30. CARCHARODON CARCHARIUS, Linn.

(*Eng.*—Shark).

---

## 31. CASTOREUM

(Class:—Rodentia)

*Sans.*—Gendha. *Eng.*—Castor. *Arab.*—Ashbutchegan. *Pers.*—Kundbadastar. *Hind.*—Gondabadustan; Jundo. *Duk.*—Gavad. *Guj.*—Zanda-bidastara. *Tam.*—Kasturi munai. *Tel.*—Zanun; Naru; Kukka-bejam. *Mal.*—Alu-Beeyum.

Source.—Dried preputial follicles and secretions from the Beaver Castor fiber.

Parts Used.—The concrete secretion from the dried preputial follicles and secretions from the two sacs situated near the anus.

Characters.—It is a resinous product; when fresh it is of flesh colour. After drying, it becomes brown or black. Its odour is pungent and resembles that of cat's urine. The taste is acid and bitter.

Constituents.—A volatile oil having carbolic acid 1 to 2 per cent, acrid bitter resin 15 to 58 p.c., crystalline substances such as castorin, cholesterin and salicin.

Action & uses.—It is a stimulant of the exhausted nervous system, and antiseptic. As an antispasmodic it is useful in hysteria, epilepsy, asthma, muscular tremor and tympanitis. It has a specific influence over the uterus and is given as tincture in uterine colic, as an emmenagogue in amenorrhoea and dysmenorrhoea. It is weaker in action than musk, valerian, camphor, ether on ammonia. Dose is half to one drachm in powder or in pill.

---

## 32. CATERIA LACCA or COCCUS LACCA; TACHARDIA LACCA

*Sans.*—Laksha. *Eng.*—Lac. *Hind. Mah. & Kon.*—Lakh. *Ben.*—Gala. *Mal.*—Laksha. *Can.*—Aragu; Laksha. *Tam.*—Kombarakku; Araku. *Tel.*—Laksha; Lacca; Lukkah. *Guj.*—Lakha.

Source:—"Lac is a resinous substance usually of a reddish or dark-brown colour, with a disagreeable smell and easily breakable with a cracking sound, deposited on the twigs of trees such as the banyan, croton, acacia and *peepul,* by a small insect called the "Carteria lacca". Writers are at variance as to the formation of lac. Some state that the insects attack the young branches of the trees above mentioned and fix themselves to the branches; the female insect after oviposition is effected dies, giving out from her body a reddish liquid which solidifies and forms a crust about an inch thick round the branch attacked; others again affirm that the sting of the insect affects the sap or gum of the trees, which forms the lac. Another writer is of opinion that the deposit is the excreta of the insects".—(Manual of Jail Industries (1931), Madras).

Origin of Lac:—"The minute Hemipterous insect *Tachardia Lacca* lives upon the plant juices, sucked up by its proboscis. In the adult state, the females have no power of locomotion, but the males at attaining maturity, emerge from their pupal cases, become possessed of a pair of long transparent wings, and fly away to visit the females and shortly after die. At two (in some cases three) seasons the swarming of the larvae takes place, viz: July and December or also January. The larvae are seen to emerge from the dead bodies of the females and to crawl away in quest of fresh feeding grounds. They are then minute creatures of an orange-red colour; have no responsible separation of body into head, thorax and abdomen; have fully formed feelers and powerful legs, but are devoid of any characteristics by which they can be separated into male and female. They measure about 1/40th of an inch in size. For some days the swarming con-

tinues until the twigs become distinctly reddish in colour and literally alive. The vast majority, however, perish, the more fortunate are wafted on the breezes or carried by the bees, birds, squirrels, etc., or by their own exertions, to new situations. The larvae thus become fixed, and their legs, being useless, drop off. Lastly, a resinous excretion begins to form around their bodies, which by the aggregation of many, in time assumes the condition of a more or less complete encrustation of the twigs. If, at this stage, the encrustation be cut open lengthwise, it will be seen to be of cellular structure."—(Manual of Jail Industries, 1931, Madras).

In cold weather the branches of the lac plant *(Laksha taru)* often swarm with the lac-insects and seem covered with a red dust. The insects (female) produce small nipple-like incrustation on the twigs, their bodies being apparently glued together by a liquor which forms a cellular texture. The animal resembles a small bug. After a time the young ones escape leaving empty cells on the branches. *Stick lac* is the name given to the twigs encrusted with lac (the radiated cellular substance) that are collected from the trees. These twigs are dried in the shade. The wood then shrinks, often leaving the lac as hollow tubes, but some of the wood still adheres. Various forms and sizes are given to stick lac. Thus when the resinous concretion is taken off, the twigs broken, triturated and washed in water in mortar, the greater part of the colouring matter is dissolved and the remaining granular matter is known as *seed lac*. In other words, seed lac is stick lac crushed and reduced to roundish pieces that more or less correspond to the female's cells. The dust produced when sifting the seed lac is called "Kaud". Seed lac breaks off into small particles. Grain seed-lac when melted over a fire and squeezed through a piece of calico into troughs, spreads out into thin glossy flakes known as *shell lac*, i.e., seed lac is specially washed and bleached and mixed with a proportion of arsenic and resin. This is put in bags and placed over a fire. The lac is fused through the meshes of the bag. The molten lac is spread out in sheet form and allowed to cool—the result being *shell lac* or *shellac*. (Manual of Jail Indus-

tries, 1931, Madras). If dropped in rounded masses it is known as *button lac;* if in larger pieces, it is called *sheet lac.*

*Action & Uses in Ayurveda & Siddha.*—Kashayarasam, seetha veeryam, katu vipakam, pitta-kapha-haram, snigdam, balyam, in Hicca, kasam, haemoptysis, thailam, dhatukatha jwaram.

*Action & Uses in Unani.*—Hot 2°, Dry 3°. Tonic for liver, stomach and intestine, haemostatic, resolvent of obstructions, jaundice, dropsy, kidney, reduces fat in the adipose persons.

*Uses.*—Shell lac finely powdered, half a tola mixed with honey and prepared in the form of an electuary, is given in haematemesis. Lac is a specific application for caries and diseased teeth. It is also used for inunction in the form of several medicinal oils as *Lakshadi taila.* It is prepared thus:—Take of shell-lac 2 seers, water 16 seers, boil till reduced to 4 seers and strain. To this decoction of shell lac, add 4 seers of prepared sesamum oil, 16 seers of whey, and 2 tolas each of the following substances:—Withania somnifera, turmeric, *Devadaru* wood, root of Sanseviera zeylanica, Pandanus odoratissimus, Vanda roxburghii, dill seeds and liquorice root in the form of a paste and prepare an oil in the usual way; lastly add 4 tolas of camphor. This oil is much used for inunction in chronic fever and consumption; and is applied to the chest in remittent fevers accompanied by cough and dyspnoea; also used in lumbago, myalgia, epilepsy and hysteria, as an application to the nape of the neck and spine. If this oil is applied to the body of a pregnant woman the foetus grows fatter. A decoction of shell lac is also used in the preparation of other medicinal oils such as *Chandanadi taila, Angarika taila,* etc., prepared in a similar way with the addition of various medicinal substances in the form of paste. Locally shell lac is used as a stimulant application to indolent, scrofulous and scorbutic ulcers. The fluid lac dye obtained by dissolving the crushed stick-lac in water is called *Alakta.*

---

## 33. CEPHALOPODA

See Os Sepie; Sepia officinalis.

---

## 34. CERA

(*Sans.*—Siktha; Madhujan. *Eng.*—Wax. *Arab.*—Shama. *Pers. Hind. Ben. & Duk.*—Mom. *Guj.*—Mina; Min. *Mah. Can. & Kon.*—Maena. *Tam.*—Mellugu. *Mal.*—Taenmazhacu. *Tel.*—Mai-nam. *Kash.*—Sinth. *Burm.*—H'pa-noung; Phayouii. *Malay.*—Lilin. *Sinh.*—Miettie; Itti) exists in the pollen and surface of the leaves of many plants, chiefly the wax myrtle. It is extracted by the honey bee and used in the construction of the honey comb. *Cera flava* or yellow beeswax is obtained by squeezing or pressing the comb (when the honey is extracted) and melting it in hot water and allowing to cool. It is purified by repeating this process several times and finally casting the wax into moulds. It is a yellowish solid mass (Cera Flava B.P.) harder than butter, with honey-like odour. It is insoluble in water, soluble in cold alcohol (3 p.c.) and in chloroform (25 p.c.). It contains hydrocarbons 12 to 15 p.c., cerolein, cerinor, cerotic acid which crystallizes from boiling alcohol, myricin or myricyl and melissyl palmitate, ceryl alcohol etc. Myricin is a principal constituent, crystalline, soluble in hot ether, almost insoluble in boiling alcohol. By the action of potash it is converted into palmitic acid and myricil alcohol. Wax is an emollient and demulcent, chiefly used externally as basis, in the preparation of *ointments*, *plasters* etc. Smoking opium or beeswax in a *hookah* is said to give relief in scorpion bites by counteracting the effects of poison! Equal quantities of Balsamodendron mukul, B. pubescens, wax and sesame oil are melted together and when applied over boils in the form of plaster, are effective. A *paste* made of wax, soap and root of the castor oil plant, in honey, is used for application to ulcers; this is used in dysentery where ulcers are suspected to be present. An *oil* made of wax by boiling over a fire, a mixture of yellow wax, common salt and sand and filtering and cooling the filtrate is also useful as a mild

protecting sheath, when applied into the rectum in dysentery where ulcers are suspected to exist. It is also applied with benefit to painful rheumatic joints. The oil occurs generally as a liquid, but sometimes as a solid mass of a brownish dark colour.

---

## 35. CERA ALBA

(White beeswax) is yellow beeswax obtained from the honeycomb, and bleached by exposure to moisture, air and light. A *paste* made of white wax 2 tolas, Lawsonia alba or senna leaves 2 *mashas* and rose water 4 tolas is recommended by Hakims, as a local application for fistula in ano.

---

## 36. CERA FLAVA

See:—"Cera".

---

## 37. CEREVESIA LACTIS

See:—Koumiss or Kumyss.

---

## 38. CERVUS ARISTOTELIS

See:—Cervus Elephus.

---

## 39. CERVUS DAMA, Linn.

(*Sans.*—Mrigasring; Haranasing. *Eng.*—Hart's horn; Deer horn) is used in the form of a powder. It is of white colour, without odour or taste and contains 57.5 p.c., of phosphate of lime. The powder is prepared by burning hart's horn in closed vessels and then reducing the ashes to a fine powder. The powder is nutritive and demulcent; it is given internally in painful affections of the joints, sciatica and lumbago, in cardialgia, pleurodynia and other affections

of the heart. Dose is 15 to 25 grains with ghee, milk or cream. Fumes of Horn are recommended as giving relief in hiccup. (Practically the same as "Spirits of hart's horn"). Its chief use is in cough and asthma, in low fever, loss of appetite and phosphaturia especially of children.

---

## 40. CERVUS ELEPHUS or C. Aristotelis or C. Equinus

(*Sans.*—Sambarasinga. *Eng.*—Stag's horn. *Pers.*—Maral; Gookorh. *Hind.*—Barasinga. *Ben.*—Ghous or Gaoj; (female): —Bhalouje. *Guj.*—Sambar singdun. *Mah.*—Meru. *Tel.*—Kannadi. *Can.*—Kadavi; Kadaba) is used in the form of powder and paste. The horn consists of three anterior antlers curved upwards, of a dark-brown or pale yellow colour, generally marked with longitudinal ridges which are irregularly tuberculated. On section, the interior is porous, hard in the centre and compact at the margin. When freshly cut it smells like burnt sugar. *Sambarsinga bhasma* (ash) is prepared by burning the horn in an open fire or by soaking its pieces in the milky juice of Calotropis gigantea and then roasting. Dose is 5 to 15 grains. This consists mainly of Calcium phosphate. James' powder may be prepared by mixing the *bhasma* with sulphuret of antimony and subjecting the mixture to white heat. This will yield antimony oxide and calcium phosphate. *Sambarsing paste* is a liquid cream obtained by rubbing the staghorn on a piece of stone, pouring hot water over it, from time to time. *Sambarasinga* is locally astringent and sedative; internally a nervine and blood tonic. The *bhasma* is given internally as a restorative tonic, with honey, in diseases of the respiratory system, as cough, asthma, consumption; also weak heart, enlarged glands and in seminal debility. It is a specific remedy in doses of 4 to 8 grains for pleurisy and pneumonia with honey and essence of ginger. The *paste* is given internally in dysentery, and locally applied with stimulating ingredients like ammonia, brandy etc., to sprains, contusions, cracks and fissures and to the forehead in headache and to relieve itching in chronic skin diseases; also to orchitis and

other enlarged glands. It is a useful remedy for the relief of rheumatic pains, and for pains in the ribs.

---

## 41. CETACEUM

(*Eng.*—Spermaceti B. P. *Urdu* & *Hind.*—Whale Machhli-ke-Barki charbi. *Arab.*—Mann-ul-qeetas) is a concrete fatty substance contained in the large cavity in front of the large Cranium (near the upper jaw) of the Sperm Whale (Physeter macrocephalus), found in the Indian and Pacific Oceans. It is obtained mixed with sperm oil or *oleum ceti.* The semi-fluid substance is obtained from the head of the whale; it is then dried in suitable bags and afterwards submitted to strong pressure to remove the oil; the pressed cake is melted in warm water and any impurities removed; then boiled with a weak caustic soda solution to solidify and this is Spermaceti. It is a pearly-white, translucent, crystalline unctuous mass of the consistence of lard, with a mild bland taste and a faint, fatty odour; it is reducible to powder when previously moistened by alcohol; it becomes rancid by exposure to the air; it has a neutral reaction. It is insoluble in water, soluble in fixed and volatile oils, ether, chloroform and boiling rectified spirit. It contains cetyl palmitate, or acetylic alcohol combined with palmitic acid forming a fat cetin. It is a demulcent. Given in alvine and urinary irritations; also used as a base for ointments and cerates. As an emollient dressing it is used for blistered or excoriated surfaces and ulcers.

---

## 42. CHELONIA

(*Eng.*—Turtle) is found on the sea coast of Southern India and gulf of Manar. The oil extracted from it (*Hind.*—Kachakru. *Guj.*—Kachbo. *Mal.*—Lisk; kurakura; kulitpaum) is a pale yellow liquid of a fishy odour and disagreeable taste. It is used as alterative, nutrient and demulcent; fat is chiefly given in scrofula, rickets, anaemia and pulmonary affections. Dose is 1 to 2 drachms.

*Vaccine from tortoise.*—This is a cure recommended for consumption. The report of the Commission appointed in Germany to examine the efficacy of Dr. Friendman's vaccine for the treatment of tuberculosis says.—"The vaccine is valuable in the anti-tuberculosis struggle as having given surprising results after one or two injections. The vaccine is composed of the pure cultures of the tubercle bacilli of the tortoise".

---

## 43. CLAMATOR JACOBINUS, Bodd. or Hirundo rustica, Linn. or Aegithina tiphia, Linn.

(*Eng.*—Common Iora; Swallow. *Sans.*—Chataka. *Hind.*—Tokka. *Ben.*—Chatak). Flesh is refrigerant, stomachic, cardiac stimulant and nutritious. Used in epistaxis and phlegmatic ailments.

---

## 44. CLUPEA ILISHA, Ham & Buch

See:—Pisces.

---

## 45. COCCUS CACTI (Dactylopius coccus—Family:—Coccidae) belonging to Insecta class and Hemiptera Order

(*Eng.*—Cochineal insect. *Pers.*—Danaha. *Hind.*—Beerbouhtee; Kirminj. *Guj.*—Kiramaja. *Tam.*—Kiramjee; Kochinil-puchi. *Tel.*—Kiramju; Cochinil purugu. *Can.*—Kiramjee) is an insect of a scarlet (red) colour and little larger than a bug, resembling a grain, found in Mexico, and feeding upon a prickly plant, a species of Cactus (called the Nopal plant in Mexico). The dried bodies of the fecundated female insect containing eggs and larvae are used in medicine. The insects are collected from the branches and leaves of the Cacti, crushed and immersed in boiling water, spread out and dried ready for use. When dry they can be easily reduced to powder. Dose is 1 to 10 grains. It contains carmine (the colouring matter) or car-

minic acid 10 per cent, wax coccerin, fatty matter consisting of myrestin, liquid fat and fatty acids 18, moisture 6, salts and ash 3 to 5 per cent. The carmine prepared from the insect is a brilliant red powder with a faint odour and bitterish and warm taste; it tinges the saliva violet-red. It is soluble in water and alcohol, entirely soluble in ammonia water. It has acid properties and hence called carmiric acid. It is used only as a colouring agent, as an adjunct to expectorant mixtures. It possesses sedative and anti-spasmodic properties. It is useful in whooping cough, neuralgia etc. There are two sorts of Cochineal:—Silver and Black. Silver is more valued; it has a greyish red colour.

---

## 46. COCCUS LACCA

(See:—Cateria Lacca; Tachardia Lacca).

---

## 47. COLUMBIA LIVIA or DOMESTICA

(*Eng.*—Pigeon. *Sans.*—Kapota. *Hind.*—Kobutar. *Ben.*—Payra). See "Animal Flesh" paragraphs for action and uses.

---

## 48. CORALLIUM RUBRUM

See:—Iris nobilis. *Class.*—Polypi.

*Sans.*—Pravala; Vidruma. *Eng.*—Coral. *Ger.*—Korallian. *Ital.*—Corallo. *Fr.*—Corail. *Arab.*—Bussud. *Pers.*—Marjau. *Hind.*—Parvara; Munga. *Duk.*—Gulli. *Mah. & Kon.*—Povalay. *Guj.*—Parvala. *Tam.*—Pavalam. *Can.*—Havala. *Tel.*—Pagadamu. *Mal.*—Poalam. *Sinh.*—Bubalo. *Burm.*—Ky-a-ve-khet.

Source.—Red sea; Persian and Arabian Gulfs, Mediterranean sea and Atlantic Ocean.

Characters.—In appearance it is a small shrub in a pendant or reverse position. It occurs in slender, cylindrical and generally branched pieces of brick-red colour. Coral is made

up of numerous minute pieces; each piece is minutely and longitudinally furrowed. In smell it resembles frankincense; it easily breaks with crackling sound. In a raw state the stems and branches are covered with a cortical substance which is the habitation of soft small polypi.

Constituents.—Animal or organic matter 8 p.c., carbonate of lime 83 p.c., magnesium carbonate 3.5 p.c., and oxide of iron 4.5 p.c. The red colour is due to its containing iron.

Parts used.—The Calcareous shell or skeleton.

Preparation.—Coral is purified by being boiled in a decoction of the three myrobalans and then prepared for medicinal use by being calcined in covered crucibles and then reduced to powder. *Pravala Bhasma* (Coral ash) is also prepared by soaking coral for sometime in lime-juice, then putting it in fire and calcining and finally reducing it to a fine powder. Dose is 5 to 20 grains.

Action.—Antacid, astringent, nervine tonic, laxative and diuretic; also "emetic antiphlegmonous and antibilious"—(N. N. Sen Gupta).

Uses.—As a local astringent it is used in the preparation of tooth-powders. Its chief use is in cough, phthisis, asthma, low fever, urinary diseases, spermatorrhoea, gleet and gonorrhoea, carbuncle, scrofulous affections, and as a nervine tonic in headache, giddiness and vertigo. Dose is 3 to 12 grains twice a day after meals. It was administered to cases of chronic bronchitis and pulmonary tuberculosis and found useful in both classes of diseases. It is given as an antacid to check vomiting and to cure dyspepsia and bilious headache. *Vasanta Kusumakara Rasa* described in Bhaishajyaratnavali, containing coral and pearl and also prepared gold, tin, lead and iron, talc and camphor is prepared with a difficult process into a pill mass and divided into 4-grain pills. These are given with sugar, honey and ghee in urinary diseases, impotence, gleet, diabetes, consumption and general debility. It is also a valuable alterative tonic in chronic gonorrhoea and spermatorrhoea, given in combination with an extract called *Kusavaleha* which

is made up of the five roots of *Ikshu, Sara, Kasa, Kusa* and *Darba* with sugar.

---

### 49. CORVUS SPLENDENS SPLENDENS, Vieill.

(*Eng.*—Crow. *Sans.*—Kaka. *Ben.*—Kak). Flesh is stomachic, nutritious, cardiac-stimulant and beneficial in ulcer, phthisis and eye diseases.

---

### 50. CROCODILUS POROSUS, Schneid.

(*Eng.*—Crocodile. *Sans.*—Kumbhira. *Ben.*—Kumir). Flesh is demulcent and refrigerant; beneficial in vitiated bile.

---

### 51. CROCOPUS PHOENICOPTERUS, Lath.

(*Eng.*—Green dove. *Sans.*—Harita. *Hind.*—Harial. *Ben.*—Hathela-Ghugu). Flesh is astringent, refrigerant, easily digestible; produces '*vayu*' and alleviates thirst and epistaxis.

---

### 52. CYPRAEA MONETA, Linn.

(*Eng.*—Porcelaneous shells; Cowry; Marina shell. *Sans.*—Varatika; Varataka. *Arab.*—Sadaf. *Pers.*—Khar-mahra. *Hind.*—Cowrie; Sipi. *Ben.*—Beya. *Guj.*—Codi. *Tam. Mah. Kon. & Can.*—Kavdi. *Tel.*—Gavalu. *Sinh.*—Pingo) is the name given to small, convolute glossy shells of variegated colours, of oblong oval shape varying in size from a tamarind seed to an almond. The upper face is smooth, shining and convex. Base is compressed with a cleft in the centre which runs longitudinally. The margin of the cleft is serrated on one side and depressed on the other. Three varieties of cowries, white, red and yellow, are used in medicine. Ancient Hindu alchemists preferred shells which were of yellow colour, knotty and possessed of circular lines on the dorsal side. The fresh shells consist of a cellular gelatinous tissue filled with calcareous matter (earthy salts). They are insoluble in water,

soluble in hydrochloric acid with effervescence. They contain phosphate, flouride and carbonate of calcium, magnesium phosphate, manganese and sodium chloride. The cowries are first purified by being soaked or macerated for 3 hours, in lime-juice or rice *conjee* (sour gruel) and then calcined in covered crucibles; the process is repeated 10 or 12 times. Another method of purifying cowries, as given in "Rasendrasarasangraha" is:—Dig a hole in the ground and fill it partly with the husk of paddy; now place on it a crucible containing cowries; cover it with cowdung cakes and set fire to the mass. By this process the cowries are reduced to ashes. It is the lime thus obtained which is often used in medicine. *Cowri bhasma* (shell-ash) is pungently bitter, also alterative and expectorant. It is recommended in dyspepsia, jaundice, enlarged spleen and liver, asthma and cough. The ash is given internally in scalding and gonorrhoea. Dose is 5 to 10 grains. It is externally used as caustic as various forms of ointments. *Shula Gaja Kesari* is a compound pill made of purified shell, mercury, borax, rock-salt, asafoetida and carui seeds all in equal parts, mixed and reduced to a pill-mass with the aid of the juice of betel leaves. Dose is 3 to 5 grains, useful in colic and other pains in the intestines.

---

## 53. CYPRINUS ROHITA

This is the bile of the 'rohitaka' fish; it is used either singly or in combination with the bile of buffalo, wild boar, goat and peacock, under the name of *Pancha pitta* or the five biles. Bile is laxative and is chiefly used in soaking powders intended for being made into pill masses. *Udakamanjari Rasa* described in *Rasapradipa* containing bile of *rohitaka* fish, is given with ginger juice in recent bilious remittent fever. If there is much heat of head, cold water should be applied to it.

---

## 54. DACTYLOPIUS COCCUS

See:—Coccus cocti.

---

## 55. ELEPHAS INDICAS & ELEPHAS AFRICANUS; ELEPHAS MAXIMUS

(*Sans.* & *Kon.*—Hasti. *Eng.*—Elephant. *Hind. Mah. Duk.* & *Guj.*—Hathhi. *Ben.*—Hati. *Tel. Tam. Mal.* & *Can.*—Aanay) is a large-sized animal belonging to the class of Proboscidea; it is common in India, Burma and Africa. The teeth or tusks of this animal are the parts used in medicine. The ashes or powder of the teeth (*Eng.*—Ivory. *Arab.*—Sin-ul-fel. *Sans.*—Hastidanta. *Hind.*—Hathidant. *Sinh.*—Gallah. *Burm.*—Hsen. *Pers.*—Dandan-i-fel. *Mah.* & *Kon.*—Hastantra) is prepared in the same way as *Sambarsinga bhasma.* Dose is 5 to 15 grains. It is used as astringent in leucorrhoea; also given in jaundice and to remove sterility in females. *Paste* made of the nails of the elephant 2 parts, copper sulphate 1 part and saffron 3 parts, in milk is applied in conjunctivitis.

---

## 56. ELEPHAS MAXIMUS

See:—Elephas indicas

---

## 57. EQUUS ASINUS, Linn.

(*Eng.*—Ass. *Sans.*—Gardabha. *Hind.*—Gaddha.) See:—LACTUS.

---

## 58. EQUUS CABALLUS, Linn.

(*Eng.*—Horse. *Sans.*—Ashva). Milk is stimulant and demulcent. Urine is bitter, stimulant, stomachic and purgative. Urine is beneficial in ringworm and intestinal worms.

---

## 59. EUDYNAMIS SCOLOPACEUS, Linn.

(*Eng.*—Cuckoo; the Koel. *Sans.*—Kokila. *Hind.*—Koil. *Ben.*—Kokil). Flesh is phlegmatic and antibilious.

---

## 60. FEL BOVIS

(*Eng.*—Fresh ox gall. *Arab.*—Safraul-bagaz. *Pers.*—Zabrahe-gaw. *Hind.*—Bail-ka-sofra. *Duk.*—Bail-ka-pit), is fresh ox-gall secreted by the liver and collected in the gall-bladder; it is a dark or yellowish green viscid liquid of a peculiar unpleasant odour and bitterish taste. It is neutral or faintly alkaline in reaction, soluble in water and alcohol.

---

## 61. FEL BOVINUM PURIFCATUM or Fel Tauri Depuratus

(*Eng.*—Purified ox-gall or ox-bile. *Sans.*—Gorochanam. *Arab.*—Hajr-ul-bahr. *Pers.*—Pad-Zehare-Havani. *Hind.*—Zehar-mohra. *Duk. Mah. Kon. & Can.*—Gorochana. *Guj.*—Guruchandan. *Tam.*—Gorojanai. *Tel.*—Gorojanam. *Sinh.*—Visagul. *Burm.*—Goyazin) is prepared by evaporating ox-gall to one-third, adding alcohol, filtering, distilling off and evaporating until it acquires a suitable consistence for making pills. *Gorochanam* is light and can be easily broken between the fingers. It is laxative, anti-spasmodic, cholagogue, cooling and aromatic. It is specially indicated in measles and small-pox, to reduce excessive heat in the body; also in whooping cough and watery stools and choleraic symptoms. It is used in convulsions, hysteria, spasmodic diseases, melancholia and intestinal disorders with deficient secretion of bile, in jaundice, etc., and in abortion. It is given to infants for stopping green stools and (in small doses) as a laxative. The usual adult dose is from 5 to 10 grains. It enters into the composition of some medicines used for skin diseases.

---

## 62. FELIS TIGRIS, Linn.

(*Eng.*—Tiger). Tiger's fat is used in leprosy and rheumatism.

---

## 62(a). FEL TAURI DEPURATUS

See:—Fel bovinum purificatum.

---

## 63. FRANCOLINUS PONDICERIANUS, Gmel.

(*Eng.*—Grey Partridge. *Sans.*—Tittiri. *Ben.*—Titir. *Tam.* —Toluk-petta). See "Animal Flesh" Section, for action and uses.

---

## 64. GALLUS BANKIVA

Denotes wild form of the genus; & *var.*

---

## 65. GALLUS DOMESTICUS

Is a domestic cock and hen. The Indian domesticated game-cock is known as Gallus pugnex = Gallus pusillus of Linnaeus. See:—Phasianus;—(*Sans.* & *Ben.*—Dimba). The part used in medicine is the egg of it (*Sans. Hind.* & *Ben.*—Anda. *Arab.*—Baiza. *Guj.*—Bedun. *Mah.* & *Kon.*—Kavta. Can &. *Tam.*—Mottey. *Tel.*—Gadda). The white is the *Ovi albumen*, often called also Albumin—the liquid albumen of egg; (other varieties are called after their sources or characteristic reactions, as acid-albumin; alkali-albumin; muscle-albumin; serum-albumin; ovum-albumin; vegetable-albumin etc. Normal albumin is the type of a group of proteids known as albumins). It contains albumen 15 to 18 p.c., a little mucus, fat, sugar, extractive matter, lecithin, ash consisting of alkaline salts and water 82 to 85 p.c. This albumen is distinguished from albumen of the serum of blood, by being coagulated by ether. In weight it is about 5 drachms in one egg. The yolk or *Ovi vitellus* is a dense viscid, yellow or reddish-yellow opaque alkaline liquid. It consists of water 50 p.c., vitelline 16 p.c., inorganic salts 1.5 p.c., oil globules, fat 30 p.c., sulphur and phosphorus contained in a sac or bag. Agitated with water it forms a milky emulsion. It is coagulated by heat and by alcohol. Action:—Egg is emollient, demulcent, laxative &

nutritious. The egg shell or *Ovi Testa* is a white hard fragile calcareous substance composed of carbonate of lime, phosphate of lime and traces of sulphur and iron, some organic matter 1 to 5 p.c. and salts as the chlorides, iodides, sulphates and phosphates of potassium, calcium and magnesium. The oil known as the *yellow oil* is prepared by boiling the egg hard, removing the yolk and acting on this by hot *Movara* spirit or brandy. The oil globules separate and dissolve in the hot spirit; this is used as an embrocation. The ashes are prepared by incinerating the shell. *Glyceritum Vitelli* or glycerine of yolk is a dietetic preparation containing the yolk of egg 45 p.c., and glycerine 55 p.c. *Mistura Spiritus Vini Gallici* is another preparation made up of yolk of 2 eggs, brandy 4 ounces, Cinnamon water 4 ounces and refined sugar 4 drachms. Dose of this mixture is 1 to 2 ounces. *Egg wine* prepared by beating up one egg with a tablespoonful of cold water and a mixture of a glass of sherry and half a glass of water previously heated together, (not boiling) poured over this and stirred all the time, then sweetened with white sugar and a little grated nutmeg to taste and taken with toast or biscuits, twice daily is more digestive and nourishing to invalids. *Egg syrup* is prepared by beating 1 lb. of eggs with 1 lb. of water and then straining it through a cloth and then beating it to a froth and then adding 1¾ lbs. of powdered sugar and 20 drops of orange-blossom water. When used it is mixed with 10 times its volume of water. Egg is a complete food; it contains all the elements required by the blood. *Eggs covered with boiling water and allowed to stand for 5 minutes are more nourishing and digestive than eggs placed in boiling water and allowed to boil furiously for 3½ minutes.* Eating a hard-boiled egg when angry produces the same effect as eating a toadstool according to Dr. Hilton Ira Jones, a noted chemist and psychologist. "The poison in toadstools is a chemical substance called muscarine". Dr. Jones says:—"The greater part of an egg is composed of colin, a harmless substance. When a person is angered, the acidity of the stomach is increased, oxidising the colin. When oxidised the colin of the egg becomes muscarine, the poison in toadstools. That is why the effect is the same." One of the oddest food cures recently advanced is

that of medicated eggs. Hens are fed on wheat mixed with a salt of iron. The eggs they lay three or four days later are rich in iron already digested, so that even the most delicate patient can take it. The Albumin i.e. *white of egg* is useful in cases of poisoning by corrosive sublimate perchloride of mercury, soluble salts of lead, copper, zinc, creosole etc. In poisoning by other acrid metallic salts it acts mechanically by enveloping the poisonous particles and also coating the mucous membranes of the stomach and intestines. Mixed with hot brandy and alum its paste is used as an embrocation or *lep* (plaster) in erysipelas. The *yolk of egg* is demulcent, more nutritious than the white and in large doses, laxative. The giving of egg-yolk to infants above the age of two months is a preventive against rickets. Yolk of egg is an extremely useful food for anaemic persons. *Locally* with lime or mixed with nitrate or oxide of mercury, it is used as a *lep* and applied to plague and other buboes and to boils to promote suppuration. As a restorative, mixed with brandy it is given internally to the weak and anaemic; also to the dyspeptics. It is used for emulsifying oils, oleo-resins and resins. The ash is antacid and styptic and used as a powder in gravel and in cases of cancer.

---

## 66. TURBINELLA RAPA; or XANCHUS PYRUM; or GASTROPODA (Monovalve or Univalve shell—a Group of Shell Fishes)

(*Class:*—Mollusca).

*Sans.* & *Bom.*—Shankha. *Eng.*—Conch; Conch-shell. *Duk.*—Sukk. *Guj.* *Mah.* *Kon.* & *Can.*—Shankha. *Tam.*—Sanka; Sangu. *Tel.*—Sehkham. *Ben.*—Sankh.

Source.—Indian Ocean coasts.

Characters.—A porcelaneous shell of an oblong or conical form. The oblong form is bulged in the middle and tapering at each end. The conical variety is peculiar. The upper portion is like corkscrew, twisted and tapering at the end. The base is broad. The interior is hollow. The surface is hard, of a dull white colour. The upper surface is highly tubercu-

lated, the under surface shining, very brittle and translucent.

Action.—Anodyne, carminative, digestive and astringent. Flesh is demulcent, cardiac stimulant, nutritious & phlegmatic.

Preparations & Uses.—*Shankha bhasma* or conch shell ash (silicate of magnesia) is prepared by soaking the shell in lime juice and calcining in covered crucibles ten to twelve times, and finally reducing it to powder (ash). It is anodyne, carminative, digestive and astringent. Dose is 2 to 6 grains; used for ear-ache, ulcers and for eye-troubles and internally for dysentery, gonorrhoea, colic, dyspepsia and jaundice; with whey it is taken in tympanitis, flatulence, colic etc. A compound pill called *Shankhavati* contains *Shankha bhasma* 40, tamarind seed ash 20, the five salts *(pancha lavana)* 4, asafoetida, ammonium chloride, pepper, carui, caraway, ginger, long-pepper each 4 parts, purified mercury and aconite each 2 parts, mixed together and the whole triturated in the juice of lemons and made into a pill-mass. Dose is 3 to 5 grains. *Shankhavati* is used in dyspepsia and acid urine as also in irritability of the intestines as in diarrhoea, chronic dysentery etc. A mixture of *Shankha bhasma* 5, aconite 2 and black pepper 9 parts made into two-grain pills is useful in loss of appetite, dyspepsia and indigestion. A compound powder made up of *Shankha bhasma* 5, bonduc seed 4, asafoetida 3, *trikatu* and rock salt 4 each parts, mixed and powdered is used in the colicy pain in the abdomen. Another compound powder containing equal parts of *Shankha bhasma,* Ficus religiosa, borax and aconite is used in catarrh, sore-thoat, cough, asthma etc. Dose is two grains. *Kaphaketu Rasa* (see "Sodii Biboras") containing conch-shell lime is also useful in these cases, and also in discharges from ears, nose etc. In all sorts of *Kaphaja* type of fever it is used as an expectorant, a resolvent of the phlegm and febrifuge. Flesh is useful in phthisis and abdominal tumours.

---

## 67. GECKO VERTICILLATUS, Laur.

*Eng.*—A kind of lizard. *Sans.*—Musali. *Ben.*—Takshakha. *Hind.*—Chipkuli. *Tam.*—Paillie. Used in leprosy.

## 68. HALCYON SMYRNENSIS SMYRNENSIS, Linn.

(*Eng.*—Kingfisher, Kilkila. *Ben.*—Macch-ranga). Flesh is refrigerant and demulcent. Useful in epistaxis and produces "*vayu*".

---

## 69. HALICORE DUGONG—ERXLEBEN & H. australis.

(*Eng.*—Dugong oil or Oil of Sen Hog). This oil is a substitute for cod-liver oil.

---

## 70. HELIX ASPERA

(*Bom. & Guj.*—Nakhala) is a fresh water Mollusk. The shell is of dark-brown colour and made of numerous plates placed one upon another, just as in bivalve shells. It is hard, bony and opaque, concave on its under-surface where the mollusk resides; the other surface is convex. On this surface the layers are most distinctly marked. The shell is used in the form of a paste, as a perfume and in the preparation of various medicated oils. It is an ingredient of *Dhupela tela.* As a hair cosmetic it is highly recommended.

---

## 71. HEMIPTERA

(*Eng.*—A group of winged insects. *Pers.*—Shaker-e-tigala. *Hind.*—Shakara tagara) occurs as irregular gall-like pieces of a dirty white colour and oblong or oval or sometimes of irregular shape. It is hollow within and generally contains a dead beetle or pupa of an oval shape and black colour. It tastes like starch and after chewing it leaves an acrid sensation in the mouth. It is an antispasmodic and useful in hysteria, gout, renal diseases, dropsy, gonorrhoea and jaundice. It is generally used by Mahomedan Hakims. A compound powder consisting of it and almonds, pistachio, babul gum, bark of Mimusops elengi and dry ginger all in

equal parts, powdered finely and mixed together, is used in old chronic coughs. Dose is grains 5 to 10; two or three times a day.

---

## 72. HIRUDINARIA (POECILOBDELLA) GRANULOSA, Savigny.

(*Eng.*—Medicinal leech.)

---

## 73. HIRUDO MEDICINALIS

(*Class.*—Annelida).

*Sans.*—Jaluka. *Eng.*—Speckled Leech. *Arab.*—Aluk. *Pers.*—Zaloka. *Hind. Ben. Duk. & Punj.*—Jonk. *Kash.*—Drik. *Guj.*—Jalo. *Mah. & Kon.*—Jalu. *Tam.*—Attei. *Tel.*—Attalu; Jelagalu. *Can.*—Jigani. *Mal.*—Attah. *Burm.*—Himyau; Meiyon. *Sinh.*—Kudallu; Pudal.

Source.—Leeches are found in a clear shallow or deep pool of water containing water lilies and other aquatic sweet smelling plants. They are collected on a piece of Calico containing some red clay; when leeches are required to be preserved for some days the roots of water lilies are given them as food.

Characters.—Leeches are of both aquatic and terrestrial habits. *Small and middle sized leeches are the best for medicinal use.* They are black, or of an olive colour, marked with 6 longtitudinal stripes. The body is elongated 2 or 3 inches long and tapering at each end. It is convex and wrinkled transversely. *There are other varieties of leeches, some of which are venomous and these are found near putrid fish or animals, in foul, stagnant and putrescent water. Such leeches are consequently to be avoided.*

Action & Uses.—Antiphlogistic, used for the local abstraction of blood; also anticoagulant. Depletion by leeches is analogous to the abstraction of blood by venesection, by lancing or by moist cupping. The quantity of blood drawn off by

each Indian leech is about 1 to 1¼ drachm. The antiphlogistic action is slow. They make a limited or gradual local impression. They are used in acute inflammation of the glands, as the mammae, parotid etc., also in incipient abscesses, boils, in bruises, sprains and blows, in inflammations of the serous membranes and in inflammation affecting the skin or bones. This is generally followed by hot fomentations to relieve the pain and the inflammation. Obstinate vomiting may occasionally be checked by a few leeches to the pit of the stomach after ordinary means have failed. In violent headache leeches are applied to the temples with benefit. In fevers with severe headache they are applied *but only in the early stages of the disease;* they are applied at the nape of the neck if relief is not obtained by applying to the temples. In severe pain in the chest or abdomen occurring during fever 8 to 10 leeches applied immediately over the seat of pain often afford manifest relief. In severe headache or fulness of head depending upon the stoppage of a discharge of blood from piles, leeches close to the anus frequently afford great relief, *but care is necessary lest they creep up into the rectum.* When the headache depends upon the sudden stoppage of the menstrual discharge the leeches should be applied to the inner part of the thighs. In acute dysentery a few leeches (6 to 9) to the verge of the anus are often serviceable in relieving the pain and strain ing at stool. The same measure is also useful in congestion of the liver, when placed over the region of the liver, and preferably at the verge of the anus. When leeches are scarce and it is intended to abstract more blood, the leeches may be punctured with a needle just near the tail, while still sucking or when nearly gorged with blood, when the blood is drained out of their body and they begin to suck again.

To stop the bleeding continuing after the removal of the leeches, various haemostatics are used, such as burnt cotton, desiccated alum, copper sulphate, tannin, turmeric, burnt rags, cobweb, scraped lint etc. Pressure with the finger over the bite may be useful. In obstinate cases solution of the perchloride of iron is used with benefit. Even a very fine point of caustic nitrate of silver is inserted into the wound with benefit.

Touching the bite with the point of a red hot needle or applying a ligature or pressure by lint and bandage has also been tried with success.

Precautions.—To make a leech bite on a particular spot cut a small hole in a piece of paper, lay this over the spot and apply the leech over the spot which should be previously cleansed and smeared over with cream or sugared milk or the skin scratched so that a little blood oozes out. To facilitate the action of leeches or to promote the bleeding from leech bites the affected part should be thoroughly washed or cleaned with hot water. In some cases poultices or fomentations should be applied to stimulate the skin. *Leeches should not be applied immediately over a large prominent vein, nor to the eye lids nor to the bosom of a woman, especially during pregnancy, nor to the loose skin of the eyelids, mammae, penis or scrotum as the bites in these situations are apt to be followed by infiltration or inflammation. Great caution is necessary in applying leeches to young children as they bleed much more freely than adults; they should, when practicable be applied where a bone is near the surface, so that in case of excessive bleeding pressure may be made against it.* Generally one leech is sufficient for every two years of the patient's age up to adult life, or six is the limit for ordinary cases, even upto adolescence; *for application, morning is the best time. It should not be put on in the evening, lest there be serious consequences from haemorrhage and want of proper attendance.*

Applications.—If the leeches do not fix quickly apply a drop or two of milk or blood to the part. Some apply clay to the part, others prick it with a fine needle to make the skin besmeared with blood, which will induce them to fix themselves more readily. When the leeches are sucking, sprinkle a few drops of water upon their bodies. When the leeches are to be removed, sprinkle a small quantity of salt upon their head to make them drop off. After their removal the part upon which the leeches have been is to be smeared with honey, cold water and astringent substances. If the bleeding continues the abovementioned measures are to be adopted. If after their removal it is necessary to abstract more blood, poul-

tices of bran or bread or varalians, of *Nirgundi* leaves or of Neem leaves may be applied.

---

## 74. IRIS NOBILIS

See Corallium Rubrum.

---

## 75. KOUMISS or KUMYSS or KUMISS (Fermented Milk) Cerevesia Lactis

Is a fermented liquor obtained from cow's, mare's or camel's milk. It is prepared by adding sugar of milk to fresh milk in an open vessel and beating it till it ferments or by adding some acid to fresh milk to assist lactic acid fermentation. During fermentation caseine and butter are skimmed off and the fermented whey is collected. It contains 1 to 3 per cent of alcohol, sugar, lactic acid, salts, carbonic acid and ether. Dose is 2 to 4 ounces. Kumyss is a dietetic, nourishing and restorative agent, given in diabetes, in irritability of the stomach and in obstinate vomiting. For process of Artificial Koumiss, refer Extra Pharmacopoeia.

---

## 76. LACCA

See:—Cateria Lacca; Coccus Lacca.

---

## 77. LACERTA AGILIS (Agama Agilis)

belonging to Reptilia (*Eng.*—Sand Lizard. *Pers.*—Rege mahi. *Guj.*—Sarado. *Bom.*—Ghilodi) is a species of a sand fish with thorny spines. It has a head and four legs; when dry the skeletons appear more like a fish without head and legs. It is of a light brown colour, about six inches in length with darkish brown reticulations on its back. It is used in the form of ash or *bhasma* in doses of 5 to 8 grains as a nervine tonic, stimulant and aphrodisiac in general debility, spermatorrhoea and seminal weakness. It is used by Unani physicians with the yolk of eggs.

---

## 78. LACERTA VIVIPARA

*Eng.*—Lizard.

Action.—Flesh is tonic, stimulant, alterative.

Uses.—Flesh is used in syphilis. Oil is aphrodisiac.

---

## 79. LACTUS

*Sans.*—Dugdha; Ksheera. *Eng.*—Milk. *Arab.*—Halib. *Pers.*—Sher. *Hind. Guj. Mah. & Kon.*—Dudh. *Tam. & Tel.*—Palu. *Mal.*—Musu; Pala. *Can.*—Haalu. *Sinh.*—Ella errie.

Source.—Mammary glands of females, cows, she-goats, ewes, she-asses, mares etc.

Characters.—Cow's milk is an opaque, white or yellowish-white, emulsive, faintly alkaline fluid, a little more viscous than water; taste is sweet and bland, odour faint and peculiar; kept for a long time it ferments. Specific gravity is between 1.027 to 1.034, and the milk with a higher fat content having a lower specific gravity. Under the miscroscope, numerous minute fat globules are seen floating in the form of an emulsion, which on standing for some hours settles out producing the familiar phenomenon known as creaming, *i.e.*, a scum forms on the surface in the form of cream, which when churned, separates into butter and butter-milk. The yellowish white colour of the milk is due to the suspended fat globules. On standing, the milk settles out into 3 layers. The layer at the bottom of the vessel contains bacteria, cells and dirt. That at the middle contains milk plasma, and a small amount of fat; the layer at the top contains fat or cream and a considerable number of bacteria which are carried up being attached to fat globules. This settling of milk enables one to isolate the butter fat and to control the amount of fat the milk shall contain. ***Raw milk becomes spoiled after 10-12 hours, after which it is indigestible and harmful and acts as poison to the system. Such milk should be avoided.***

Constituents.—Milk contains all the elements necessary for the growth and nutrition of bones, nerves, muscles and

other tissues. Milk contains also vitamins which are Nature's antidotes to rickets, scurvy and other results of defective nutrition. The constituents of milk vary according to the animal and the kind of food it takes. *Cow's milk* contains on an average albuminoids (casein) 4, fat (butter) 4, sugar (milk-sugar) 5, various salts etc., 1, and water 86 per cent. It contains a large proportion of Calcium phosphate, an important salt required for the formation of bone and also for the proper coagulibility of the blood. The other mineral constituents of Cow's milk are potassium and magnesium phosphates, sodium chloride and a trace of phosphate of iron. The inorganic constituents of milk are gases as carbondioxide, nitrogen and oxygen in solution, and mineral salts as compounds of calcium, potassium, sodium, phosphorus, iron sulphur and chlorine. The first four are present in slightly higher amounts than necessary to combine with sulphur, phosphorus and chlorine available, the excess being principally calcium which is combined with casein as calcium caseinate. The composition of milk, especially the fat and to some extent the protein content, varies from time to time. *Buttermilk* is composed of water 91%, fat 0.5%, sugar 4%, lactic acid 0.5%, protein 3.5% and ash 0.7.% *Whey* is composed of water 93%, fat 0.32% to 0.36%, lactose 4.9 to 5.4% protein 0.84% to 1.0%, and ash 0.49% to 0.6%.

Cow's milk contains a little more salts and fat and much less sugar than the breast milk. Still, the protein content of the cow's milk is much less efficient than that of breast milk. Cow's milk consists of fat globules, and bacteria, cells and particles of foreign matter suspended in a fluid, i.e. milk plasma, in large numbers. Though secreted from the alveoli in a sterile condition, bacteria are introduced into the milk through the milk duct from the teats, from bits of manure and dust flying in the stable, from the milker's hands or from saliva droplets. The bacterial content of the milk is the best single index of the cleanliness with which the milk is handled and scrupulous care should be taken to keep it at the lowest by milking healthy cows, kept in clean surroundings, employing healthy milkers with clean hands and using clean, well-scalded

receptacles. *The milk so obtained should be chilled as soon as possible after milking.*

In cow's milk the protein is present in the form of casein in combination with calcium and is in the form of colloidal particles which can be seen with the ultra-miscroscope. The other protein constituents are lactalbumin and lactoglobulin.

A comparison of the breast and cow's milk proteins:—The proteins are made up of various combinations of aminoacids, of which about 20 have been identified. In the breaking up of proteins into amino-acids, there are several stages, viz:— Proteins—albumoses—polypeptides—peptides—amino-a c i d s. Of the amino-acids about four are essential in a child's diet. These are tryptophane, lysine, crystine and hystidine. The value of a protein depends upon the number and proportion of amino-acids that go into its make up and its ability to be digested and absorbed.

Lactalbumin contains 4.08 per cent of cystine while casein contains only 0.26 per cent. So the greater lactalbumin content of the breast milk makes it more valuable than the cow's milk. Hence it is that breast-milk protein is more adaptable for the infant than the cow's milk protein. However, cow's milk protein is the next best and to supply an adequate amount of protein, a larger quantity, nearly double the amount of cow's milk should be given to infants. The following table will prove the relative value of the last two in relation to breast-milk, and that Indian cow's milk approaches more nearly in composition to the breast-milk. Composition of milks, per 100 parts:—

| | Components: | Breast Milk | Cow's Milk | Buffalo's Milk |
|---|---|---|---|---|
| | Salts | 0.1 | 0.5 | 0.7 |
| | Fat | 3.0 | 3.5 | 6.0 |
| Solids of these proteins | Not fat | 8.0 | 8.0 | 10.5 |
| | Casein | 0.4 | 2.8 | — |
| | Lactalbumin | 1.1 | 0.7 | — |
| | Sugar | 6.5 | 4.5 | — |
| | Total solids | 11.1 | 12.0 | 17.2 |
| | Water | 88.9 | 88.0 | 82.8 |

Percentage composition of European mother's and European cow's milks:—

| | Protein | Fat | Sugar |
|---|---|---|---|
| European Mother | 1.5 | 3.5 | 6.5 |
| European Cow | 3.0 | 3.5 | 4.5 |

"Ordinarily, the amount of protein in European cow's milk is double that of European mother; the fat content is the same in both and the sugar content is a little less in the cow's milk." Hence it is that the European medical man advises that the the cow's milk should be diluted with an equal volume of water an equal volume of water and that the fat and sugar deficiency in such a mixture should be made good by the addition of one teaspoonful of cream to every three ounces of the prepared milk. This is the *'humanised milk'* of every European Text-Book. If this advice is followed in the case of Indian children using Indian cow's milk, then the child so fed will be virtually suffering from a deficiency of not only proteins, fat and carbohydrates but also the essential vitamins and salts.

Factors influencing the Composition of Milk:—

1. *Differences in breed and in individuals of the same breed:* The average of some breeds is, as a rule low. Jersey milk contains 5% of fat. In some districts and those bred in the Agricultural College (Coimbatore) Cow-breeding Station produce higher quality milk than those bred elsewhere. Cows met with in Madras City, though they appear tall and stout and yield a large quantity of milk, the milk is of a very poor quality.

2. *Difference in the same animal:*—Morning milk contains more fat than the evening milk. Strippings are richer in fat content than the fore milk.

3. *Changes in the composition during lactation:*—During the first 3 weeks, the colostrum contains a higher percentage of fat and ash. From the 3rd to the 6th week, it decreases and remains constant until the last two months before going dry. During the last two months, with a gradually de-

creasing quantity, proteins rise markedly, fats increase somewhat, sugar declines, and ash rises. Gestation is apt to shorten the period of lactation.

4. *Amount and character of food:*—Abundant, well-balanced diet is essential to maximum milk production. More milk with higher fat content is produced on a high fat diet.

5. *Richness of the pasteurage:*—The quality of the pasteurage is reflected in the richness and body-building properties of the milk.

6. Cows allowed to graze in the open air and in sun-light yield more and better quality milk than those confined to the backyard of the house.

7. *Skill of the milker:*—As the cow has partial voluntary control over the sphincters of the lactiferous sinuses, unless this is relaxed she may hold back part of the milk. Only a skilled milker can be able to relax the cow and get the richer strippings higher up in the udder.

As the composition of the same cow's milk varies from time to time, to ensure an uniform supply, it is better to use mixed herd milk obtained from a number of cows, while feeding milk to infants. *The mixed herd milk is often of the same composition.*

*Buffalo's milk* is richer than the cow's milk and yields more butter. *Ass's milk* contains less of salts and fat and more of sugar. *Human milk* contains more of fat and less of salts. It contains all the necessary elements for the tender baby and nothing more or less. *Not a single specimen of arttificial food is a substitute for mother's milk.* The food constituents of *goat's milk* contain excess of calcium and vary only a little from that of human milk. Then comes the ass's milk; then comes the cow's milk which differs much more from human milk.

*Preparations or Milk Products:*—Where cow's milk of reliable and standard quality is not available especially in cities, products prepared from fresh cow's milk are used, such as powdered milk; evaporated milk; condensed milk; lactic acid

milk; peptonised milk; butter-milk; and whey. Of these the last four are used only in feeding invalid, small, weak or premature children. This is especially so in the case of cheese, protein-milk, lactic-acid-milk and whey during the preparing of which only pasteurised-milk should be used. *Cream (Sans.* Santanika), butter (*Navanita),* skimmed milk. butter-milk (*Takra*), Curd or curdled milk (*Dadhi*), Whey (*Mastu*), Cheese, Ghee *(Ghrita)* and Milk sugar or Saccharum lactis containing Lactose. *Pasteurised milk* is absolutely safe and conserves the vitamins which boiling destroys. *Condensed milk* is sweetened fresh milk, i.e., milk to which 15 to 17 per cent of cane-sugar and an alkali is added to fresh cow's milk and concentrated to half its volume by evaporating it in a vacuum till it becomes dark and all the useless water of the milk having gone off in steam. Sugar is added as a preservative so as to do away with the need of sterilization. On being reliquified, it becomes equal to whole milk plus 15 to 17 per cent cane-sugar; vitamin content is destroyed in toto; protein content is minimal. *As it contains a high carbohydrate and a low protein content, it is not suitable for healthy normal infants.* Premature babies and babies with lower weight than normal, thrive well on it. *Lactose* is the carbohydrate content of milk. When reduced to a fine powder, milk is known as *Powdered milk* or *desiccated milk* or *Lactogen* which is obtained by removing all the water-content from the milk. The drying is done so instantaneously and carefully that the vital properties and solid constituents of the milk remain absolutely intact, though the milk is left as a fine white powder. It is easily soluble in water, and when dissolved in the proportion of 1 to 7 or 8, it has all the nutritional properties of fresh whole milk, *with the singular exception of vitamins A & B which are destroyed in the process of manufacture.* The chief are:—Allenbury's Infant Foods Nos. 1, 2 & 3; Glaxo; Horlick's Malted Milk; Cow & Gate Standard Milk Food and Half-cream Milk Food.

Merrell Soule Process, California Process, Hot Roller Process are the various processes by which *Powdered Milk* is prepared.

(a) *Evaporated Milk* is essentially fresh cow's milk that has been reduced to half its volume by evaporation in vacuo. It is fluid in consistency and has a characteristic cooked taste. It forms small curds and on dilution with an equal volume of water forms a suitable substitute for fresh milk. *The vitamin content is destroyed in the process of manufacture.*

(b) *Lactic Acid Milk* is milk boiled in a double boiler to sterilize it and break it into small curds. It is allowed to cool. When ice-cold, 0.4 per cent of lactic acid is added, drop by drop, slowly and with continuous stirring. The casein undergoes changes due to the addition of the acid, the curd becoming very finely divided.

Lactic acid milk may be prepared by bacterial fermentation. By the action of lactic acid fermenting organisms, the lactose is fermented by the lactic acid and the milk becomes soured. When a certain degree of acidity is reached, the growth of the organisms is inhibited and the process of fermentation stops; depending upon the temperature, from 8-12 hours are required. *As it contains lactic acid and as the curds are small, friable and easily digestible, this is very useful as an infant's food. The only objections to its use are its sour taste and acid smell.* E.g.—Cow & Gate's Lacidac.

(c) *Skimmed Lactic Acid Milk* is made by using skimmed milk in the place of fresh whole milk.

(d) *Protein Milk*:—Though this is not useful in feeding healthy babies, this is useful for feeding infants suffering from diarrhoea. Its composition is water 89%, protein 3.75% and salts 0.65%. Example—Cow & Gate's Prolac.

(e) *Citrated Milk* (i.e., cow's milk to which two or three grains of Sodii citras has been added to every ounce) is also used in infant feeding. Sodii citras throws the casein in the milk into small easily friable curds, which a child is able to digest without any difficulty.

(f) *Peptonised Milk* is intended for feeding invalid infants who cannot digest the usual diet. Example:—Cow & Gate's Peptalac: Composition is: Water 87.9%; Fat 2.8%; Pro-

teins 2.4%; Digested Proteins 1.0%; Lactose 3.9%; Carbohydrates 1.2%; Salts 0.8% = Total 100%. *Peptonised* or *predigested milk food* is prepared by heating milk with water (2 to 1) to a temperature of 140°F., and adding to it when cool peptonising powder or Sodium carbonate 10 grains and Liquor Pancreatis (Liquor Pancreatini—B.P.C.) 2 drachms in one pint and boiling the product.

(g) *Plasmon* is a pure soluble milk product prepared by separating Casein of milk and leaving the albumen unaltered. It is a colourless white powder, containing 92 per cent of proteids, odourless and tasteless, soluble in soup and milk. In water the powder swells up to a gelatinous mass which dissolves as more water is added. It contains albumen, phosphates of ammonium, sodium and potassium and a small quantity of common salt. *Cheese* is prepared by coagulating cow's milk by means of rennet or an acid or with yeast and after separation submitting it to pressure. Like albumen it is not coagulated by heat but is precipitated by acids. It contains mostly albuminoids (casein), fat, salts, other non-nitrogenous matter and water. Cheese is extremely rich in the growth of vitamins and most of the minerals in the original milk go into the cheese. *Eucasein* is a casein ammonium compound. It is milk-casein in a soluble and easily digestible form, prepared solely from the pure milk of the cow. It is a soluble powder containing about 95 per cent of pure absorbable albumen without any odour or taste. Used as food it is highly nutritive. *Butter* (*Hind. Guj. Pers. & Bom.*—Mackhan; Muska. *Mah. & Kon.*—Lonee. *Tam. & Tel.*—Venney. *Can.*—Bennay) is a principal fatty matter of the milk. It is obtained by heating milk and allowing it to stand; butter globules rise to the surface together with some casein and serum forming what is called cream-butter. The fat globules or butter alone is separated from casein by churning. Butter consists of olein 30 per cent, palmitin and stearin 68 per cent, glycerides of butyric, carponic, caprylic and caprinic acids 2 per cent. Milk from which cream is separated is known as *skimmed milk*. *Butter-milk* is skimmed lactic acid milk and is a residue of casein, serum and a trace of butter

left after the butter is removed by churning. It is called *Buttermilk* because it is a bi-product in the manufacture of butter. When cream is allowed to sour, the fat-globules, on being churned, accumulate into one mass of butter, leaving back the skimmed milk. This is free from fat. *Cream (Pers.*—Qimaq. *Hind. Ben. Mah. & Guj.*—Malai) is the only part of milk which is very nutritive and agreeable but not easily digestible. *Ghee* is clarified butter, obtained by boiling fresh butter and removing the impurities which settle down. *Curdled milk (Pers.*—Jugrat. *Hind. Ben. Mah. Guj. & Kon.*—Dahee. *Can.*—Mosru) is prepared by adding some acid, lime juice or rennet or a little curdled milk as a ferment to milk previously boiled. In the course of 12 hours the whole of the milk thus acted upon is changed into a more or less thick, acidulous, jelly-like mass. It contains a large proportion of nutritious substances. *Whey (Hind. & Bom.*—Chans) is the fluid watery portion of milk left after the casein or curd (fat) is separated. When evaporated it yields sugar of milk, one or two nitrogenous elements, lactic acid and salts. Whey is prepared by adding two teaspoonfuls of rennet or a little lime juice to 1½ pints of milk heated to 104°F. carefully, but thoroughly breaking up the clot which forms, i.e., allow the curds to settle, and then filter or strain through muslin. This supernatent fluid or filtrate is called *Whey*. Taste, if very sour, dilute by adding water and enough sugar to taste. (Allenbury's Torch-Brand Rennet tablets provide a convenient means of preparing whey). *Lactose* of milk sugar is a crystallised, greyish white, odourless, faintly sweet, hard mass, gritty when chewed, obtained from the whey of milk.

N.B.—Very instructive notes appear in an article entitled "Artificial Feeding of Infants" by Dr. T. V. Muthu Swami Chettiar, L.M.P., in "Medical Digest" Special Pediatrics Number, February 1936, of Bombay, and if any more information seems necessary it can be read from the following headings:—

(1) Choice of a milk product.
(2) Bottle Feeding.
(3) Additions to the child's diet.
(4) Invalid Foods.

Action.—Milk is generally considered cooling, nutritive, strengthening and vitalizing; also demulcent and emollient. Milk is the vital fluid food of the class of the animal of which it is the product. *Action of bacteria on milk*:—Bacterial action destroys milk by fermentation and putrefaction. Fermentation or souring is the usual change and consists in breaking down the lactose to lactic acid which, in turn, causes precipitation of the casein. If the milk is soured by nonpathogenic organisms it is good, as then it becomes a perfectly healthy food. Putrefaction is less common. It consists in the precipitation of the casein followed by peptonising the curd. It occurs usually in boiled milk in which the spore-forming bacilli, especially the hay bacillus and certain anaerobes have introduced. *Putrefied milk consists of products of protein decomposition and so it is apt to be poisonous.* Alcoholic fermentation can be produced by inoculation with certain yeasts. *Kumiss* and *Kefir* are alcoholic beverages made by this means. *Cow's milk* is demulcent, nutrient, cardiac tonic, excitive of memory (promotes memory), and is pleasant to take, very wholesome, promotes strength and longevity and increases the secretion of semen. *Its chief defect is its rather constipating effect.* Boiling, which kills the disease germs, only seems to increase the constipating effect which can be counteracted to a certain extent by eating wholemeal bread with it. Ten ounces of such bread with a pint of skim-milk supplies a cheaper nutritious lunch and forms a third of the nutriment required for the whole day. In Ayurveda, properties of cow's milk according to colour of skin are mentioned as follows:—(1) Milk of black cows—very wholesome and good in *"Vayu"* disease; (2) Milk of yellow cows—good in *"Vayu"* and *"Pitta"* disease; (3) Milk of white cows—heavy of digestion and deranges *"Kapha"*; (4) Milk of red or speckled cows—good in *"Vayu"* disease; (5) Milk of small hill cows—more oily and heavy of digestion; (6) Milk of scanty eater cows—heavy, increases "Kapha", is very good tonic; (7) Milk of cows with calves—good; (8) Milk of cows without calves—not good; (9) Milk of cows calved long ago—good tonic, checks *"Tridosha"*.—(Jour. of Ayur. March 1926). Among the South Indians, there exists an extraordinary and

universal but disastrous belief that the fat content of the cow's milk is inimical to the child's health and gives rise to enlargement of the liver and spleen.—(Dr. T. V. Muthu Swami Chettiar, L.M.P., Tirupur P.O., S.I.Ry.). *Buffalo's milk* is sweeter, heavier and more oily than cow's milk; refrigerant, difficult to digest, demulcent, cardiac stimulant, aphrodisiac, phlegmatic and hypnotic. When taken in large quantities it induces sleepiness, spoils appetite and brings on cold. With some persons it causes purging. Buffalo's milk contains more fat than the cow's milk and is heavier. *Use of Buffalo's milk in infant feeding*:—"Unfortunately, there is an erroneous belief that feeding children on buffalo's milk is apt to cause catarrh of the children's respiratory tract. On the other hand, it is of great value, easily obtainable, contains a lot of cream, and if properly prepared, is an ideal substitute for human milk. It may be given to children when they are six months old or after the sixth month. Buffalo's milk should be diluted with 1/3rd its volume of water and the sugar deficiency made up by the addition of a teaspoonful of sugar to every ounce of milk so prepared. This will prove an ideal substitute for breast-milk. For older babies (six months and after) buffalo's milk may be given, as such, undiluted and in quantities of four ounces twice or thrice a day".—(Dr. T. V. Muthu Swami Chettiar, L.M.P., Tirupur, S.I.Ry.). *Goat's milk* is sweet, cooling, astringent, and constipating. It is very invigorating and promotes appetite and digestion. *Ewe's milk* is saltish, heating and oily, and not easily digested; it contains fat 6.18 p.c., it causes eye-trouble. It is good for growth of hair but causes respiratory trouble, ulcers on tongue, lips and gums. *Mare's milk* is saltish, acidulous, strengthening, stimulant, demulcent and alleviative of *Kapha* and *Vata*. It is generally used by the Moguls. *Ass's milk* is saltish and easily digestible; stomachic, cardiac stimulant, antiphlegmatic. Flesh is cardiac stimulant; urine is stimulant, stomachic and is useful in gout. *Camel's milk* is light, sweet, slightly saline and laxative; easily digestible, stimulant and stomachic. *Sheep's milk* is alleviative of phlegm and bile. *Human milk* is light, astringent, stomachic, refrigerant, demulcent, nutritive and strengthening. *Elephant's milk* is sweetish, astringent, muscle-

builder, heavy, fattening, increases vigour and strength. The milk milked in the mornings due to the cooling influence of the night and lack of exercise is heavy, constipative and refrigerant; the evening milk, as the animals are warmed by the sun, exercise etc., relieves rheumatism and fatigue and is beneficial to the eyes. *Raw milk* (except human) is heavy; *boiled milk* is lighter, but becomes soon contaminated and hence the need of care. Some are of opinion that milk is not suitable to Indian stomach and not so easily digested as in European stomach. European medicine has noted that milk in some persons causes constipation, in others diarrhoea. *The latter is generally the case with Indians and pure milk diet to Indian patients in diarrhoea is, therefore, contra-indicated. Yet in certain cases of chronic diarrhoea with fever, with a suspicion of tuberculosis it is not desirable to semi-starve the patient when pure milk diet with mercurials (Parpatis) is given with benefit, and no other food or drink (including water) is given. Butter* from cow's milk is tonic, cardiac, stimulant, invigorating and stomachic. Butter from buffalo's milk is "sweetish, astringent, refrigerant, demulcent, generative of semen, alleviative of wind and bile". *Butter-milk* is astringent, light, cooling, appetising, nutritive and tonic. *Curds* or *Curdled milk* is agreeable, digestive and cooling; it is acid and astringent, "relieves *Vayu,* produces marrow, semen, strength and blood, aggravates *pitta* and *kapha,* helps digestion, and is an appetiser"; taken to excess it causes biliousness and catarrh. It is good for meat-eaters in whom proteolytic coli predominates. It aggravates amylolytic fermentation and hence Ayurvedic restriction for its free use by vegetarians. *Ghee* (*Sans.*—Ghrita; Ghrittham. *Hind.*—Ghi. *Ben.*—Ghee; Ghrita. *Tam. & Tel.*—Neyi) is chiefly prepared from the milk of cows and buffaloes. *Cow's ghee* is stomachic, nutritient, anti-bilious, tonic, improves memory. *Ghee* is considered cooling, emollient and stomachic. It increases the fatty tissues and mental powers, improves the voice, beauty and complexion. *Whey* has properties similar to those of curdled milk; in particular it favours the circulation of the animal fluids and therefore useful in constipation. Whey from buffalo's milk is "phleg-

matic and generative of oedema"; *Curd* of milk (*kilataka*) is hard of digestion, but is nourishing, tonic, and suited to persons with strong digestive powers. *Cream* is also hard of digestion but nourishing, agreeable and demulcent. *Powdered milk* (desiccated milk or Lactogen) is claimed to be sterile, readily soluble in water, forming a homogeneous solution, which does not cream, and forms small soft curds. *Lactose* is nutrient; also uterine, stimulant and tonic. It is harder, less soluble and less sweet than cane-sugar and therefore is a better excipient and diluent for powders that require trituration. Lactose is a powerful diuretic—a renal diuretic like caffeine and theobromine. Dilute acids convert it into glucose. Nitric acid converts it into oxalic and mucic acids—a differentiating point from other sugars.

Uses.—As an article of diet, milk is peculiarly adapted for all—the children, the aged, wounded, emaciated, starved or those exhausted by sexual excess, for suckling women, for patients suffering from *chronic* fever, mental diseases, gastric catarrh, ulcer and cancer of the stomach, gastric disorders such as dyspepsia, intestinal disorders as diarrhoea and dysentery, albuminuria and other urinary complaints, ascites and anasarca. *But in "low fever" according to Susruta "milk should not be drunk as it might even cause death."* A pure milk diet to the exclusion of every article including salt and water even, is often prescribed in the later stages of anasarca, ascites and chronic bowel complaints; along with this diet some medicine as *Dugdhavati, Suvarnaparpati* or *Manamandu* is usually prescribed. Milk is useful in relieving irritation of the respiratory and digestive tracts or organs. A mixture of equal quantities of skim milk and cream is an excellent natural cure for acid stomach or heart-burn. For persons troubled with insomnia a cup of hot milk before retiring to bed is recommended. Malted milk is also good for this condition. Persons complaining of a feeling of distension after a drink of milk are recommended to add and dissolve a pinch of salt to each cup of milk to be taken. Milk is a very effective remedy in poisoning by corrosive sublimate, copper sulphate and even by corrosive acids. According

to Allopathy, in enteric fevers and mucous diarrhoea, milk is administered freely diluted with barley water or with lime water or any other diluent. *According to Ayurveda, milk is not given in mucous diarrhoea. Kemp says that sour milk is beneficial in some patients having mucous diarrhoea, but aggravating in others!* According to Allopathy in the treatment of low-fever cases, fresh milk well diluted and peptonised is useful. Milk is frequently used as a vehicle to poultices. Dr. Moravesik of Budapest states that *milk injections* are more effective in parasis than anti-syphilitic treatment—(Lancet). In *acute* iritis from whatever cause improvement after milk injections is prompt, especially the subsidence of pain"—(Practical Medicine, March 1926). In infants who are constitutionally predisposed to eczema (parental) injections of 1 to 4 cc. of milk are given. Repeat the injections every fourth day till 5 or 6 or even 10 injections are given—(Junagadh Rosullkanji Hospital Bulletin). Milk protein injections:—"Dr. Geo. Gelhorn says"—"While milk protein injections cannot be expected "to raise the dead" they do much to build up the natural immunity to the patient in certain crises. Ophthalmic physicians and surgeons are using them in corneal ulcer with 100 p.c. results. Injection of milk 5 cc. the first, 8 cc. the third day and 10 cc. for following injections with an interval of one or two days between injections; this interval to be lengthened if severe reactions occur. Reactions, as a rule, occur after the first two or three injections only, and the severity of the reaction has nothing to do with the results accomplished. The course of treatment consists usually of ten injections, although remarkable results have followed three or four doses. The white cell count was distinctly raised, although quite gradually, after injections to full normal. He stated that he was using milk protein before operations".—(Clinical Medicine). As an *embrocation* to clear the skin and complexion, milk is applied to the body and within half an hour the application is followed by a warm bath. *Goat's milk,* plain or medicated, is useful in phthisis (consumption), bile *(pitta),* cough, chronic diarrhoea and vomiting in children; *"pitta"* variety of "Arsa" *(piles);* cures dyspnoea, bronchitis, chronic cases of enlarged liver and

spleen, and gastrorrhagia. With barley-gruel goat's milk is recommended when the patient suffering from dysenteric diarrhoea is weak, and goat's milk alone and ghee from it are by themselves very good diet in convalescence after diarrhoea. *Ewe's or Sheep's milk* is beneficial in obesity, flatulence and gonorrhoea; is a good diet in rheumatism and hectic cough. *Ass's milk* is useful in general debility, high coloured and scanty urine. It is extensively used as a remedy against cough and liver complaints especially among children and old people, and in chronic bronchitis, pertussis and consumption. *Mare's milk* is beneficial in the rheumatism of the extremities. *Camel's milk* is useful in oedema, dropsy, asthma, phthisis, leprosy, general scrofulous conditions, inflammations, cancers, piles, intestinal worms, skin lesions, abdominal tumours and poisonings. It is used in Asia. *Human milk* is recommended as a collyrium and as an application to head in eye complaints, and in epistaxis, for irrigation of the nose, as well as for irrigating the eyelids. It is recommended also to grown up people suffering from chronic asthma and consumption. In China those suffering from chest diseases suck women and find relief! *Elephant's milk* is beneficial to the eyes. Its curd is beneficial in *sula* pains and in diseases resulting from vitiated *Kapha.* The butter and ghee is stomachic, antiphlegmatic, antibilious and anthelmintic. *Butter from cow's milk* is used with sugar in phthisis, piles, chronic dysentery, anorexia, facial paralysis etc. It agrees best with the old and young. It is given in irritation of the alimentary canal in albuminuria and in diabetes; it is beneficial in chronic dysentery, piles, trismus and anorexia—(Charaka). In dysentery it is used with *sang jirun.* Use of plenty of butter and other fatty foods is a preventive and curative of Beri-beri. *Locally* it is smeared over the leaves of Calotropis gigantea, Argyreia speciosa, etc., and used as soothing applications over the abdomen in colic. Two tolas of cow's butter washed in water one hundred times and mixed with half a tola of sandal oil is an application that cures all sorts of sores—Pandit J. L. Duveji. Plantain leaves besmeared with butter are used as a coating over burnt or blistered surfaces. *Butter from goat's milk is* "stomachic, cardiac, alleviative of *tridoshas* and beneficial in eye-

diseases; alleviative of cough, phthisis and phlegm *(kapha)*. Butter from any milk is a fatty food and is used also as an ointment base. *Butter milk* is efficacious in cases of dyspepsia; and is of great use in feeding infants suffering from diarrhoea. It is a fine remedy for most cases of digestive disturbance, especially those accompanied by fever. It is a sovereign beverage for those who are predisposed to attacks of appendicitis, a nice beverage in a tropical country like India and is largely used by the middle and poorer classes. It is found to contain vitamin C. Butter-milk or water mixed with 6 *mashas* (70 grains) of alum powder or *Bhringraj* leaves pestled in a mortar cause vomiting and thus counteract poisonous effects in cases of serpent-bites. *Whey* is highly useful in phthisis, dysentery, piles, tumours, colic, catarrh, and fresh *whey from cow's milk* is especially recommended, medicated with carminatives, according to Ayurveda, in chronic diarrhoea when carbo-hydrate is contra-indicated, and particularly when "*Vayu*" is deranged in excess in order to check fermentation; in convalescence after diarrhoea, and in chronic cases of enlarged liver and spleen. Whey is generally very good, particularly so in "*Vayu-Kapha*" variety of piles, when the internal channels are blocked, and is excellent when given with rock-salt. It is also recommended in strangury, in constipation, splenitis, stomatitis, adiposis, flatulence and also in jaundice where it is given with carbonates of potassium and sodium. In fevers attended with coryza and anorexia, whey mixed with *trikatu* is given with much benefit. A diet of whey, fruit and vegetables is much in vogue for those who have lived too freely. In gastro-intestinal disturbances of children whey in doses of 2 to 4 ounces per feed every three or four hours is given. Whey can very well be used whenever a fat-free diet is required, especially in feeding small, weak or premature babies or invalid children who cannot digest fat. *Curd* is usefully given in anorexia, nausea, vomiting and rheumatism. It is given with pomegranate bark or *sanga-jirun* in diarrhoea or dysentery in children. *Whey from buffalo's milk* is "beneficial in spleen, piles, diarrhoea and cholera." *Curdled milk* is useful in jaundice fever and urinary disorders, and is an antidote of copper. Curds mixed with black pepper administered to the person bitten by serpent

is said to counteract the effects of poison.—(Pundit J. L. Duveji). Ayurvedic practice is not to give curd (fermented milk) in mucous diarrhoea, but a solution of milk, salt and sugar by curdling the milk by lime-juice and straining the curd, the watery portion left is given. *Ghee* by itself or mixed with honey, is much esteemed as an application over wounds, inflammatory swellings, and blistered surfaces, with either betel or plantain leaves, for promotion of quick healing; ghee is also used in the preparation of medicated oils, and as an ointment base. It is locally annointed in irritability of the skin, used as an injection in wasting diseases. *Internally* it is given with honey, sugar and with mineral ashes *(Bhasmas)* or *Matras* in tympanitis, painful dyspepsia and retained secretions. "Ghee, sugar-candy or honey mixed is a medicine for all ordinary complaints of children." "To those children who incessantly cry and do not suck mother's milk give sodium chloride mixed with ghee and sugar-candy"—Pdt. J.L. Duveji. Ghee is dropped into the nose in coryza and applied to the face to improve complexion and impart beauty. According to Darpana, in strong fevers, an emulsion of sandalwood and of old ghee or clarified butter that has been washed a hundred times in cold water, or an emulsion of black pepper and ghee, is used for applying to the body of the patient, followed in about half an hour by a tepid bath; then he is made to lie on the bedding made of the leaves of Nelumbium speciosum. *Purana ghrita* (old ghee) or ghee more than ten years old has a strong pungent odour and reddish-brown colour. It is a very valuable external application in pleurisy and painful affections of joints. Ghee or clarified butter a hundred years old is sometimes available; some specimens of it are quite dry and hard and nearly inodorous. They look more like some sort of earth than an animal substance. It is first repeatedly washed with cold water and then rubbed with cold water till it is reduced to a soapy frothy fluid which is used as a *liniment.* It is regarded as cooling and emollient and is much used as a liniment in nervous diseases such as insanity, epilepsy, neuralgia, paralysis, cephalalgia and asthma, in rheumatic affections, stiff joints, burning of the body, hands or feet, affections of the eyes etc.—(Chakra). It has also a great reputation for reducing

the temperature in fever. This is doubtless due to the free perspiration induced by the application. For pains in the breast, old ghee mixed with the powder of dry ginger proves highly beneficial. Ghee which is 111 years old is called *Maha-ghrita.* It is "demulcent and alleviative of wind and phlegm". *Ghee from buffalo milk* is "flatulent, cardiac, excitive of digestive fire, and generative of the secretion of semen, and is beneficial in piles and diarrhoea". *Ghrita* (ghee) from *camel's milk* is refrigerant and stomachic, and is good in "*Vayu*" variety of "*Arsa*" (piles), useful in convulsions, worms and leprosy. *Cream* is used as a vehicle for certain calxes administered unto a patient of pulmonary consumption, cough and asthma. *Lactose* is useful in debility, phthisis, gastric irritability, and for sweetening the food of infants. It is specially useful in the dropsy of cardiac or renal origin. As uterine stimulant it is given in protracted labour, after the os has been fully dilated. Buttermilk, whey, protein milk and peptonised milk are commonly used in feeding invalid children.

Purity of milk is most important. Dangers of impure milk are many. Spread of disease by milk, through contamination of milk supply:—

(1) By contamination from the udder, bovine tuberculosis and Malta fever or brucella infection are transmitted.

(2) Milk sickness is a poisoning caused by drinking milk of cows suffering from trembles, a disease of the cows due to poisoning from eating the rayless golden rod.

(3) Scarlet fever, septic sorethroat, typhoid fever, diphtheria, dysentery, diarrhoea due to bacillus enteritidis or some such organism, are the common diseases spread as a result of contamination by infected persons handling milk.

(4) By contamination of milk supply by flies, almost any diseases with discharges, suppuration or excreta as dysentery, cholera, typhoid group of fevers, diarrhoea, pyogenic or septic infections may be transmitted.

*Prevention of these diseases is by pasteurising the milk soon after it is obtained.*

Milk is rendered safe from tubercle etc., by heating it over the flame of a gas-ring turned very low and slowly or over any other form of slow heat to about 170°F., and then taking it off and allowing it to stand in a cool larder or place; skim off the cream next morning and the residual "scald" milk becomes fit for use. Pasteurisation consists in killing the bacteria of milk by heating it to a temperature of 142°F., to 145°F., for 30 minutes, chilling it at once and protecting it from any subsequent contamination by careful handling. Effects of boiling milk:—(1) Milk becomes sterile, all the bacteria having been killed. (2) Milk takes on a yellowish tinge due to changes in the milk proteins and partial caramalisation of lactose. Albumin is coagulated, and casein partially breaks down. (3) Fat globules are broken up and clusters of globules separated so that a cream line forms less readily. (4) Some of the calcium is precipitated out as insoluble calcium phosphate. (5) Small amounts of antiscorbutic and antiricketic vitamins present in fresh milk are destroyed. (6) Enzymes present are rendered inactive. Hess and Matz of New York (J.A.M.A., May 17, 1924) say that "lemon juice may be added directly to cow's milk, 21 c.c. (about 5½ drachms) to a quart of milk, without producing curdling. In this way the milk is rendered more digestible and its true acidity in the stomach is made to resemble more nearly that of human milk. Infants thrive well on it. Lemon juice also supplies the antiscorbutic vitamin". Advantages of the use of boiled milk in infant feeding are:—(1) It is sterile and so free from disease-causing organisms. (2) Casein is precipitated in small, easily friable curds, i.e., in an easily digestible form.

To avoid any deficiencies in infant-feeding, for every one ounce of breast-milk, one and a half ounces of undiluted cow's milk should be given with half to one teaspoonful of sugar per ounce. "During the first six months after birth, when the child is expected to live entirely on mother's milk, if the mother is a delicate and weak individual, lacking in the quality and quantity of breast-milk necessary for the child, the child besides being given artificial feeding, cow's milk properly 'humanized' may be used during this period of six months to sup-

plement breast-feeding. After the sixth month, cow's milk with wheat and *ragi* flour made into *conji* is gradually superadded. The patent foods now flooding the market and straining the financial resources of parents cannot have the vitamin value of fresh milk and fresh wheat and *ragi flour*. It is, therefore, essential that both from the economical and the nutritional points of view, the fresh cereals, wheat and *ragi*, which contain sufficient protein, carbohydrate and vitamins, should be preferred to the patent foods. Most of our infantile troubles and mortality are due to bad feeding and could be obviated by the judicious use of our nourishing cereals with cow's milk".—(Rao Bahadur Dr. M. Keshava Pai, O.B.E., M.D.). The usual practice of infant feeding is to dilute the cow's milk with an equal volume of water, then boil it, allow the cream to settle, and remove the cream so settled; it is given to the child, adding sugar just to taste. Though such removal of the cream does not totally deprive the milk of its fat content, the remaining fat is quite inadequate to meet the child's requirements. By this practice, the protein, sugar, fat and salt (not to speak of the vitamins) contents of the milk are very much lowered and the child so fed suffers from malnutrition, emaciation and constipation. When the child so fed is constipated, under the erroneous belief that it is the fat content of the prepared milk that is causing constipation, the milk is still further diluted and thus the fat content removed in its (almost) entirety, and the child is fed on milk so prepared. The result is that the existing constipation is aggravated, the liver hypertrophies as its functions are not fully exerted and the spleen also hypertrophies. Only in the later stages (i. e., by the time the liver atrophies and becomes smaller in size either on account of disuse, disease or toxic irritation) does the enlargement of the spleen becomes obvious. Meanwhile, the child requires a rectal injection of glycerine every day to have a regular bowel motion. These cases, if not attended to early and if the dietary deficiency is not made good at an early date, almost, as a rule, seek an early grave. On the other hand, when a child is fed on a mixed feeding of breast-milk and such diluted cow's milk, it does not suffer from severe constipation, enlargement of the

liver or spleen, but growth and development are considerably delayed and symptoms of rickets set in.—(Dr. T. V. Muthu Swami Chettiar, L.M.P., Tirupur, S.I. Rly.).

---

## 79A. ORYCTOLAGUS CUNICULUS (formerly LEPUS RUFICAUDATUS, Geoff.)

(*Eng.*—Rabbit. *Sans.*—Sasaka. *Ben.*—Khargosh). Flesh is refrigerant, astringent, stomachic and cardiac stimulant; beneficial in fever, jaundice, diarrhoea with fever, phthisis, cough and piles.

---

## 80. MABUIA CARINATA, Schneid.

(*Eng.*—Indian Skink. *Punj.*—Regmahi). Oil is restorative, stimulant, aphrodisiac and antisyphilitic.

---

## 81. MACASUS RHESUS

(*Eng.*—Monkey. *Sans. Hind. & Ben.*—Banar). Flesh is difficult to digest and haematinic; beneficial in eye diseases, phthisis, cough and piles.

---

## 82. MEL

(See:—Apis Mellifica)

(Class:—Hymenoptera)

*Sans.*—Madhu; Makshika. *Eng.*—Honey. *Arab.*—Injubin; Asatulnahl. *Pers.*—Shadad Angabina. *Punj.*—Saht. *Kash.*—Mhach. *Duk.*—Shahad. *Hind. Ben. & Guj.*—Madha. *Mah.* Madh. *Kan.*—Mhou. *Tam. & Mal.*—Taen. *Tel.*—Taenu. *Can.*—Jaentuppa. *Sinh.*—Mipanny. *Burm.*—Pya-ya. *Malay.*—Ayurmader.

Source.—Beehive or honey comb, where it is deposited by the honey-bee. It occurs in the nectaries of flowers where-

from it is sucked by the bees and then stored up in the comb. The finest honey is the virgin honey which drains itself from the comb, and that which is freshly procured from the hive. Honey sold in the bazaars is derived from the honey-comb of several species of wild bees.

Characters.—It is a viscid, saccharine substance, semi-translucent liquid of a light yellowish-brown colour, of an aromatic odour and of a sweet acrid taste. After a time it becomes opaque and crystalline.

Constituents.—Grape-sugar or dextrose which becomes crystalline, fruit-sugar or levulose which remains liquid; wax, volatile oil; proteids, mucilage, colouring matter, formic acid and ash; (rich in carbohydrates). Some of the substances contained are pollen dust, ethereal oil, various phosphates, lime (calcium) and iron. Most of the elements found in the human body are, in small proportions, present in honey. The dextrose and levulose present in it are monosaccharides and are absorbed easily. As regards the vitamin content, it is stated that honey contains both the fat-soluble and water-soluble principles. Honey contains a special protein secreted by the bee. In addition it contains a diastatic ferment similar to that of saliva and having the power of converting starch into sugar. In short, chemically, honey is mainly a mixture of dextrose and levulose.

Varieties.—Eight sorts of honey are described by Susruta:—(1) *Makshika* or the honey collected by the common bee called *madhumakshika.* (2) *Bhramara,* or the honey collected by a large black bee called *bhramara.* This is beneficial in phlegm, cough, fever and epistaxis. It is used as a linctus. (3) *Kshaudra,* or honey collected by a sort of small bee of tawny colour, called *Kshudra.* This is useful in eye diseases. It possesses all the properties of *Makshika madhu.* (4) *Pauttika,* or honey collected by a small black bee resembling a gnat, called *puttika.* (5) *Chhatra,* or honey formed by tawny or yellow wasps which makes their hives in the shape of umbrellas. This is beneficial in haematemesis, worms, leucoderma, gonorrhoea and alleviative of giddiness, hysteria and

poison. (6) *Argha* or wild honey collected by a sort of yellow bee like the *bhramara*. This is beneficial in "eye diseases, piles, cholera, cough, phthisis, jaundice and ulcers." (7) *Audalaka* is a bitter and acrid substance found in the nests of white ants. (8) *Dala* or unprepared honey found on flowers. It is "producive of digestive fire, generative of bile and beneficial in phlegm, gonorrhoea and vomiting". Of these varieties the first four only are described by writers and the first alone is used in medicine.

Action.—New honey is considered demulcent and laxative. Honey more than a year old is astringent, demulcent, detergent, pectoral, emollient and laxative. It also possesses nutritive properties. The fatty acids present in honey stimulate peristalsis and digestion. Honey in moderate doses has a beneficial effect on the digestion and appetite of those with weak stomachs and loose bowels. Its value lies in providing a readily absorbable food. It is the most potent fuel to provide energy for muscle, and consequently most valuable for that all-important, most vital muscle—the heart, which knows no complete physical rest. Lime in honey is wonderful in regulating the secretions of internal glandular organs, being equally good for persons of both sexes, irrespective of age—from infancy to old age. Again it has hypnotic action in bringing sound sleep if taken with cold water before going to bed in doses of 2 teaspoonfuls in a big cupful of water. Babies generally fall asleep after taking honey. It decreases flatulence and increases general metabolism and also the quantity of urine among children. Locally applied it stimulates the mucous surfaces, when in an atonic condition. It also acts as styptic. A special protein secreted by the bees contained in honey, when inoculated into rabbits causes the formation of antibodies in the serum.

Uses.—Honey is much used in the preparation of confections and electuaries and as an adjunct to decoctions, pills and powders. Of all the natural foods rich in carbohydrates honey is the most wholesome, valuable and delicious. As a demulcent, honey and warm barley water are given internally in constipation and indigestion, in bronchial affections, asthma,

chronic colds, troublesome coughs and sore-throat. It is a useful laxative for children who take it readily; and it is safer and far better for them than cane-sugar. When combined with milk, honey forms an ideal food for growing children and adults. A mixture of honey and distilled vinegar or lime-juice in equal parts melted together by gentle heat is an excellent adjunct to cough mixtures and for the coughs of children this combination with an equal quantity of water with or without a few drops of paregoric is an excellent remedy. Honey is a pleasant vehicle for administering bitter mixtures for cough and fever especially in children. In severe cases of malnutrition with heart weakness and in cases of pneumonia, honey has been found to have a marked effect in reviving the heart's action and keeping the patient alive. Dr. G. N. W. Thomas cites (Lancet—Health, Feb. 1925) a case of pneumonia in which the patient consumed 2 lbs. of honey during the illness; and there was an early crisis with no subsequent rise of temperature and an exceptionally good pulse. Instead of depending on milk and beef-extracts, as is done in so many cases of fever where the stores of sugar in the body are being rapidly used up, he suggests that honey should be given for general physical repair and above all for heart-failure and grapes constitute a valuable adjuvant. He further states.—"If sugar and pre-eminently honey be the most potent energy for muscle, should we not remember to give it for that all-important and most vital muscle of all—the heart which gets no complete physical rest: other muscles, yes, but for the heart, no respite—until the tale is told." In the West, honey is coming into more and more extensive use in curing rickets, marasmus, malnutrition, scurvy and other conditions in which various malts, like cod-liver oils and other patent foods were formerly prescribed. In old age honey is specially useful in providing energy and heat to the body, which has little of it at that stage. In addition to it "it dries up the phlegm and clears the system of mucus which are the two necessary weaknesses that a man generally falls victim to in his old age." A teaspoonful or two in a cupful of boiling water and taken while still warm is a refreshing and strengthening draught, giving much relief to those suffering from asthma. The use of honey

internally and of sunlight externally to the body direct, has been eulogised as an ideal remedy to regulate the secretion of the internal glands and calcium metabolism. Practitioners of Hindu-Greek-Arabic Schools of Medicine give honey to diabetics with many of their medicinal preparations. The ferment and a special protein as well as the Vitamins in honey, perhaps account for the beneficial action of honey in diabetes. *Since honey consists of velulose it is not harmful in diabetes.* A *paste* of it with flour is a popular application to promote maturation of abscesses, ulcers and buboes. As an emollient, it is used as a *gargle* to cure aphthae in the mouth and as a vehicle to other agents; it is used as an *application* to the throat in thrush and pseudo-membranous deposits. As such it is also applied to sore nipples and to swollen mammae for drying up milk. With lime (*chuna*) it is used as an external application to the temples in headache, to the abdomen or round the navel in colic and to other painful parts, such as bruises and sprains. Honey by itself or mixed with ghee, applied to burns, ulcers, scalds and wounds soothes and heals them rapidly. Rubbed over the teeth with charcoal powder it makes them clean and white as snow. Rubbed over greasy, dirty hands, it cleanses them rapidly.

It is said that Goliath and Hercules of ancient times and Ramamurthi the great Indian Sandow, were in the habit of taking daily honey in their diet. Hence their might, strength and infinite capacity for work. Not only to those who wish to build up a strong body, but also to those suffering from diabetes, honey is a wholesome food, as those cannot indulge in any kind of sugar.

---

## 83. MEL DEPURATUM

## or 84. MEL DESPUMATUM

(*Eng.*—Clarified honey) is the honey of Commerce, melted in a water-bath and strained while hot through flannel previously moistened with water. It is a viscid translucent liquid of light yellowish or brownish-yellow colour, gradually

becoming partially crystalline and opaque, of characteristic odour and of very sweet taste. It is demulcent, laxative, and nutritive; used chiefly as a vehicle for other medicines, e.g., powders; it is also one of the best vehicles for medicines used for curing cough, asthma, fever, dyspepsia, etc. It consists mainly of various kinds of sugars.

---

## 85. MONOVALVE SHELL

(See:—Gastropoda.)

---

## 86. MOSCHUS MOSCHIFERUS

(Class:—Ruminantia)

*Sans.*—Kasturi; Mriganabhi; Mrigamadha. *Eng.*—Musk. *Arab. & Pers.*—Mishk. *Hind. Ben. Guj. Mah. Kon. Can. Tam. Tel. & Mal.*—Kasturi. *Duk.*—Mushk. *Sinh.*—Urula. *Burm.*—Kado. *Malay.*—Jabat.

Source.—Musk producing animal (Musk-deer) is found generally in China, Russia, Assam, Central Asia, and pine forests and the inaccessible cliffs above 8000 feet of the Himalayas. "Musk is found in these animals only in the rutting season and is undoubtedly for the purpose of attracting the female."[1] "Chinese traders say that the best kind of musk is not obtained from captured animals, but is gathered from the favourite haunts of the deer after the rutting season, when the animal breaks the gland with its hoof and empties the contents on the ground. Musk of this kind is extremely difficult to obtain and is, therefore, rarely seen on the market."[2]

Characters.—Musk proper is an inspissated and dried secretion (testicular extract) from the preputial follicles of the male musk deer (Moschus moschiferus). "The material is found embedded in a sac which is oval or round with a diameter of about 1½ inches; the upper surface is flat with a smooth membrane and the under surface is covered with stiff

hairs arranged concentrically round a small opening".[3] The animal on an average yields 2 to 4 drachms of the secretion. Each animal (male) yields one musk-pod 2 inches in diameter. It occurs in irregular, reddish black, slightly unctuous grains. "Musk when fresh is milky but later turns viscid and assumes a brownish-red colour. It retains its strong diffusible odour for a long time and has a bitter aromatic taste";[4] it is soluble in alcohol to the extent of about 10 per cent, in water to about 50 per cent, also in ether and alkalies. The watery solution is faintly acid. It stains the paper yellow and when burnt it gives off urinous smell, leaving greyish ash about 8 per cent. The smell entirely disappears when triturated with camphor, powdered ergot, valerian, bitter almonds, fennel, garlic, hydrocyanic acid or oily seeds, or when long dried over the fumes of sulphuric acid. The odour returns on exposure to the air and moisture. "Musk is remarkable for the power, permanency, and stability of its odour, everything in its vicinity becoming affected by it and retaining the scent for a long time".[5]

Constituents.—Musk contains ammonia, oleine, cholesterin, fat, wax, gelatinous matter, albuminous substances and leaves an ash. Ash is composed chiefly of the chlorides of potassium, sodium and calcium. "Musk yields by distillation with steam and subsequent purification, a small percentage of a viscid, colourless oil with a very powerful and agreeable odour of musk; this oil appears to be a Ketone and has been termed muskone."[6]

Varieties.—Bhavaprakash describes three varieties of musk, viz: *Kamrup, Nepala* and *Kashmira* musk. Assam musk or *Kamrup* musk is of a very strong odour, of black colour, superior to the others, and hence costlier. It is probably China or Tibet (Chinese) musk brought via Kamroop. *Nepala* musk is described as of bluish-black in colour and intermediate quality. *Kashmira* musk is inferior to all. "Russian musk possesses a poor fragrance and hence is not much esteemed".[7] "Chinese or 'Tonkin' musk is at present the most highly prized because of its freedom from any unpleasant smell suggestive of ammonia which is sometimes

found in the inferior brands. A variety of musk known as 'Cabardine' musk which comes from the northern parts of Mongolia and Manchuria, is not used for first-class products because of its penetrating unpleasant odour".[8]

Remarks.—The term "musk" is loosely applied to a number of products of both animal and vegetable origin characterised by the peculiar odour of the true perfume. The season during which musk is present in the skin gland covers about one month and in order to secure the valuable secretion of the gland, the animal must be caught in the rutting period. No musk is obtainable from animals in the other seasons of the year. The contents of the pod vary in bulk with the age of the animal. A yearling yields scarcely any musk, and a two-year-old fawn has in its skin gland contents one-eighth of an ounce of musk, which is milky, and has an unpleasant smell. A full-grown buck gives about two ounces, but specimens containing one-third to one-half of an ounce of musk are common.[9] "The odour of musk is so strong that it can be perceived at a distance when the animal is shot and it is said that the hunters very frequently suffer from the strong odour emanating from the fresh musk as it acts deleteriously on the nervous system, eye-sight and hearing."[10]

Action.—According to Ayurveda, musk is a diffusible stimulant, anodyne, antispasmodic, cardiac, expectorant, diaphoretic, diuretic, laxative, antiseptic and aphrodisiac. It acts principally on the heart and the nervous system. It exhilarates the mind and stimulates the brain, spinal cord and the peripheral nerves. It improves the circulation and raises arterial tension. It is a stimulant of the urino-genital organs. It is also reputed to stimulate the respiratory centre. It is eliminated in the urine, sweat and milk. When taken, its first effects are to stimulate the vascular system and the brain. After a time it acts as a narcotic or soporific. Its effects are more manifest in excitable and nervous persons than in others. "In Western medicine, according to Mudaliar, David and Reddy's experiments in 1929 of musk-solution and tincture of musk administered orally in doses of 2 grains, and intravenous injections of 10 to 20 mgm. of the soluble portion

of musk in 1 to 2 c.c. of water respectively, to animals, have shown that musk has no sedative effect[11] and has a well-marked effect on the cellular elements of the blood. The total number of leucocytes are said to be increased after oral administration. This effect is particularly marked in patients who have leucopenia, the total leucocytic count being doubled in some patients after musk, while comparatively little change is produced in normal individuals or in those with leucocytosis. They administered 10 to 20 minims of tincture of musk in an ounce of water and found that within half to one hour after administration the total leucocyte count showed a definite increase. These observations were later disproved by experiments at the Carmichael Hospital for Tropical Diseases!"[12] "Experiments in animals under urethane anaesthesia have shown that injections of musk-solution and application of same to nasal mucous membrane, showed that musk has got no special action on the respiratory system. Valentin (1903) has estimated that a total of 0.02 mgm. (0,00,000,009 mgm. per litre) can be distinctly smelt by human beings. From this, the strong sensory stimulation which is produced may be easily imagined".[13]

Action & Uses in Ayurveda & Siddha.—Mathura tikta rasam, katu anurasam, ushna veeryam, kapha vata haram, guru, aphrodisiac, in poisoning, antispasmodic, vomiting, cold, foul smell, tonic, cough, rakta-pittam.—(Therapeutic Notes).

Action & Uses in Unani.—Hot 3°, Dry 2°, tonic to heart and brain, increases vitality, nervous diseases, paralysis, apoplexy, increases hararath. In cold, diseases of cold in head, pregnancy, low temperature and anti-kapha.—(Therapeutic Notes).

Uses.—Musk is largely used in perfumery, its aroma being very lasting and holding more evanescent perfumes with it. "Perfumers use musk for imparting an odour to soaps, powders, and mixing liquid perfumery".[14] "In indigenous medicines of India musk is used as nerve sedative in epilepsy, hysteria and convulsions in children",[15] and "as an antispas-

modic and anodyne in low fevers, chronic cough, general debility and impotence. Its fame as a cardiac stimulant is so great that it is almost the last resort when everything else has failed to support the heart".[16] In Western medicine as a diffusible stimulant it is used in various adynamic fevers as typhoid, typhus, and typho-remittent fevers and in all typhoid conditions as collapse of delirium tremens, coma, typhoid-pneumonia; as an antispasmodic it is given in "gout, in lock-jaw or tetanus, hydrophobia, epileptiform and hysterical attacks, chorea, whooping cough, hiccup, asthma, colic, laryngismus stridulus, etc."[17] Under its use the patient gets refreshing sleep. "In removing rigidity of plague cases or meningitis it has no equal".—(H. C. Sen). As an aphrodisiac it is given in combination with other aphrodisiacs in seminal weakness and impotence. "Tincture of musk is very largely used by medical men in India in doses of 10 to 30 minims as a cardiac stimulant, in depressed conditions of the nervous system and as an aphrodisiac."[18] Musk externally applied to the body acts through the pores as a rejuvenator. In palpitation of the heart it is useful. "It is prescribed sometimes alone and sometimes in combination with *'Makaradhwaja'* (insoluble sulphide of mercury) and Sida cordifolia".[19] "Dr. Mitra of Kashmir (1898) found musk of great value in cardiac asthenia due to plague. He used powdered musk with great benefit".[20] "Tamil physicians in South India, prescribe musk combined with opium, to children in cases of convulsions."[21] "According to Allopathy, in convulsions of children where no definite causative factor can be determined, musk has been used with promising results in combination with chloral hydras (gr. 5 to gr. 10 according to age) and tincture of musk (10 drops to 30 drops)".[22] Musk is used in brain affections which are generally a tonic. "Crookshank (1905) spoke well of musk in acute specific infections resulting in toxic involvement of the central nervous system. He used 5 grains of the powdered musk every 2 hours with satisfactory results".[23] In the advanced stages of cholera infantum its good effects are due to its preventing effusion upon the brain. In mental and bodily fatigue leading to sleeplessness, musk is very useful. It is contra-indicated in cases where there is a deter-

mination of blood to the brain or where there is any organic complication. Musk is also reputed in curing dyspepsia and colitis. In metastatic gout where the disease affects the stomach or the head, musk gives immediate relief. Dose is one-tenth of a grain for adults; and for children one-sixtieth to one-fortieth of a grain. In low fevers with prostration, "anaemia and general debility as a result of chronic ailments"[24], two grains of musk with two of *Makaradhwaja* are given every twelve hours with the addition of honey. In remittent fever of low type *Svalpa Kasturi Bhairava Rasa* recommended in Rasendrasarasangraha, is given. It contains cinnabar, aconite, borax, nutmeg, mace, long pepper, black pepper and musk, equal parts made into four-grain pills. In hoarseness and loss of speech a *linctus* known as Mriganabhyadirabaleha prescribed in Bhavaprakash made up of musk, cardamoms, cloves, cinnamon and dates in equal parts with honey and clarified butter is given. For general depression a pill made of 1 grain of musk and 3 grains of camphor is useful. As an alterative tonic in a variety of diseases, especially in chronic affections of the lungs supposed to be caused by deranged phlegm *Vasantatilakarasa* described in Rasendrasarasangraha is given; also in dyspepsia of phthisis and other grave conditions in weak patients. It is prepared thus:—Take of prepared gold 1 part, talc and tin 2 parts each, Iron 3 parts, *rasasindura* and calcined pearls and coral, 4 parts each; mix them together, soak for seven days in the juice of sugar-cane, of the fruits Tribulus terrestris and of other strengthening vegetables. Enclose the mass in a covered crucible and roast it in a sand-bath for three hours. Lastly add to it four parts of camphor and four of musk and make into four-grain pills. Vishagbhushan Kaviraj A. C. Bisharad reports (Jour. of Ayur., Aug. 1925) a case of paralysis of tongue in an old lady of 80 years, rapidly cured by a mixture of Musk, Makaradhwaja, reduced gold and mica, reduced coral and pearl 1 grain each, dividing the mixture in three equal doses and administered with the concentrated decoction of the roots of Sida cordifolia and the root-bark of Arjuna tree ½ tola each, in addition to *Lakshmibilasa rasa* one pill at 2 p.m. administered together with 12 grains of rock salt and 30 drops of ginger

juice—(See under "Mica"). The following simple remedies are also very useful:—(1) Take of musk ½ drachm, dry ginger 2 drachms, asafoetida 4 drachms, black-pepper 2 drachms. Mix and reduce the whole to a fine powder. Dose is 5 to 20 grains; used in spasmodic and convulsive affections, such as asthma and hysteria. (2) Take of musk 1, Andropogon muricatus 5, cloves 5, ambergris 1, gold leaf 2, and honey 28 parts. Mix and make a pill mass. Dose is 1 to 2 grains; used in colliquative sweats.

N. B.:—"Chopra's work, both experimental and clinical, does not bear out the cardiac-tonic and leucocyte-raising properties";[25] that "there appears to be no foundation for belief in its efficacy in epilepsy, chorea and in convulsions of children, and hysteriform attacks; that in whooping cough and colic, its action resembles the drugs of the essential-oil group; and that the importance of musk in the indigenous medicine in India, has been very much over-rated and that it has not got any marked physiological or therapeutic properties."[26]

*I. Musk in the Animal and Vegetable Kingdoms:*—It is interesting to note that odorous substances of the nature of musk occur both in the animal and vegetable kingdom in the different parts of the world. According to Gerardin, the following animals secrete musk or similarly odorous substances:—Besides the male musk-deer, *Moschus moschiferus;* the gazelle, *Antilope dorcas;* the marten, *Mustela foina,* the faeces of which are said to have a musk-like odour; the alpine goat, *Capra ibex,* the dried blood of which smells like musk; the musk-ox, *Ovibos moschatus* which disseminates a decided musk odour and the meat of which, though it has a repulsive odour and taste, is eagerly eaten by the Indians; the zebu, *Bos indicus;* the pecari, *Dicotyles torquatus;* the musk duck, *Anas moschata,* which is found on the Gold Coast, in Jamaica and Cayenne; the desman, *Myogal moschata;* the Nile crocodile, *Crocodilus vulgaris;* various turtles, e.g., *Cinosternon pennsylvanianum;* and various Indian snakes.

The musk odour is also found quite commonly in the vegetable kingdom. It is found in *Malva moschata* and the

seeds of *Hibiscus abelmoschus*, Linn. (Malvaceae) which are utilised in perfumery; *Brassica oleracea*, Linn. var. *capitata* (Cruciferae); *Erodium moschatum*, Her. and *Geranium triste* or *Pelargonium noctuolens* of Western Africa which is odorous at night (Geraniaceae); *Rosa moschata* (Rosaceae); the wax gourd, *Benincasa cerifera*, Sav. and the Indian bottle gourd *Lagenaria vulgaris*, Ser. (Cucurbitaceae); *Adoxa moschatellina*, Linn. (Caprifoliaceae); *Achillea moschata*, Jacq., *Aster argophyllus*, Labill. and *Moscharia pinnatifida*, Mol. of Chile (Compositae); *Hyssopus officinalis*, Linn. and *Moschosma* species of India and Africa (Labiatae); *Mimulus moschatus* of Chile and North America (Scrophulariaceae); *Moschoxylon swartzii*, Juss., the musk wood of Jamaica (Meliaceae); *Guarea grandiflora* of America and the poisonous *Serjania curassavica*, Radlk. of America (Sapindaceae); the wood of the American *Clusia eluteria* (Clusiaceae); the Asiatic *Lawsonia inermis*, Lam. (Lythrarieae); the East Indian *Ferula sumbul*, Hook. (Umbelliferae); the wood of *Cordia rumphii*, Bl. of Java (Boragineae); *Pedalium murex-Peturaga cingul* of Ceylon (Pedalineae); *Cestrum nocturnum*, Linn. of South America (Solanaceae) and the Mexican wonderflower, *Mirabilis longiflora*, Linn. (Nyctaginieae), the last two named exhaling a musk odour at night.

Despite the large number of products capable of affording more or less a musk-like odorous substance, the musk-deer remains the only important commercial source of this substance.

*Preparation of Musk for the Market*:—There are several ways of preparing the commercial musk, and the best method is to dry the pod by sunning and airing immediately after it is taken from the animal. The article, because of its powerful diffusion of odour, is usually packed in hermetically sealed vessels and wooden boxes lined with tin foil. The pods from the places of production are always packed in small skin bags singly, the pod inside the bag being covered with the animal's hair or similar stuff to keep its odour from diffusing as well as to protect it from the influence of the

weather. For home consumption, Chinese traders occasionally pack the pods in silk-wrapped packages of two or three dozens each. Musk is collected from the hunters by a class of traders, who are also engaged in exporting medicinal herbs and other products of the highlands of the Szechwan Tibetan border, no Chinese merchant being engaged exclusively in the musk trade. (From:—Chopra's "I. D. of I.", pp. 423-424).

*Artificial Musk:*—Since musk fetches a high price on the market, the unfortunate little animal—the musk deer—has been ruthlessly hunted for its valuable scent pod. Fear has been expressed by foreign naturalists for the early extinction of the animal if the present rate of destruction is allowed to go on without any restriction. It is estimated that at least twenty-two pods are required to make one 'catty' of musk. (1 catty = 1-1/3 lb.) Thus twenty-two male deer must be killed before the trade can bring one catty of musk pods to the market. As the musk sac is found on the abdomen of the buck only, and as there is no distinction in appearance between the male and the female deer when seen at a distance, many more animals of both sexes must be caught or killed in order to secure a catty of musk pods. As the animals are hunted or trapped during the rutting season, they are getting exterminated and this fact, coupled with the increasing consumption in perfumery of the article in France, has led the chemists to look for some substitute of the natural article which can be prepared in the laboratory. Compounds having the odour of musk have been prepared synthetically but such substances have an entirely different chemical structure from the natural musk. These are, however, not poisonous and are largely substituted in the cheaper forms of perfumery for the expensive natural product. The musk substitutes at present known are trinitro-meta-tertiarybutyl-toluene and the corresponding compounds obtained from the homologues of toluene and the dinitro derivatives of the ketones which are formed by the interaction of acyl chlorides on derivatives of toluene. Of these, *Trinitrobutyltoluol* $C_6$ $HNO_3$ $CH_3$ $C_4$ $H_7$ has been considered to be the best. Its odour is very akin to the natural musk and is sold in perfumery under the name of ar-

tificial musk. (Chopra's "I.D. of I." p. 426).

*Adulteration of Musk and Their Tests for Genuineness:*—On account of the great demand and the difficulty of obtaining it, musk is very frequently adulterated with inert substances such as dried blood, liver, etc. Vegetable products such as beans, wheat grains, barley grains, etc., are also mixed with the commercial article at the time of preparing. As musk quickly imparts its peculiar scent to other substances with which it comes in contact, detection of adulteration from smell becomes difficult. Several methods are in vogue amongst the Chinese and Tibetan dealers, which though not very scientific, are said to afford fairly good indications as to the genuineness of the article. Whenever any doubt exists, a few grains are extracted from the pod and placed in water. If these remain granular the musk is genuine, and if these melt the musk is false or adulterated. Another test is to place a few grains on a live piece of charcoal. If these melt and bubble, the musk is pure; if they at once harden and become cinder, it is adulterated. Genuine musk even when buried does not change its odour, while impure or adulterated musk gives out an entirely different smell. Adulterated musk can also be detected by touch. Genuine musk is soft and adulterated musk is stiff to the touch. An interesting popular test for musk has been reported from the Punjab. A thread is passed through asafoetida and then through the musk pod. If after this, the smell of asafoetida remains, the musk is not genuine. (From:—Chopra's "I. D. of I." p. 425).

(1), (3) & (9)—Chopra's "I.D. of I." p. 422; (2) & (10)—p. 423; (4), (5) & (14)—p. 424; (6), (7) & (8)—pp. 424-425; (11), (12) & (15)—pp. 427-428; (13), (16) & (19) pp. 429-430; (17), (19) to (25)—p. 431; (26)—p. 432.

---

## 87. MOTACILLA MADERASPATENSIS, Gmelin.

(*Eng.*—Common Wagtail. *Sans.*—Khanjana. *Ben.*—Bond-na-cha.) Flesh is laxative and is beneficial, in diseases originated from vitiated phlegm and bile.

---

## 88. MUS RATTUS

(*Eng.*—Mouse. *Sans.*—Mushika. *Hind.*—Chua; Mush. *Ben.*—Indur). Flesh is demulcent, cardiac stimulant and useful in worms and piles.

---

## 89. MUTILLA OCCIDENTALIS

(*Sans.*—Indravadhi. *Hind.*—Indragopa; Birabavati. *Guj.*—Chomasana rata; makhamali kida) are insects of a bright scarlet colour, and velvetty, found in the commencement of the rains. They are very common in garden plants. The dried specimens as found in the bazaar are of a saffron colour. In shape, they are nearly oblong less than ½ inch long. In the form of *powder* or ashes they are a nervine tonic and antispasmodic and are used in paralysis. In colic they are given with nutmeg. An *ointment* of them made with wax is a useful aplication to swollen feet and hands.

---

## 90. MYLABRIS CHICORII, Fabr.

## 91. M. PUSTULATA

## 92. M. TRIANTHEMA

(N.O.—Coleoptera).

(*Eng.*—Telini fly; Chinese Blistering fly; Mylabris beetle. *Hind.*—Telenimakhi. *Ben.*—Telinipoka. *Duk.*—Budhoki zerangi. *Mah.*—Telni-mashi. *Tam.*—Puis-Tarinai. *Tel.*—Ejaloo) is a blistering insect (beetle) about 1 inch long and ¼ inch broad. M. chicorii is found throughout India, (northern) especially, Kashmir, Gwalior, Hyderabad, and Deccan, China, Southern Europe, South and East of Asia. "M. pustulata has recently been collected in fairly large quantities in fields of cereals and vegetables in the neighbourhood of Bangalore"—(Iyer & Guha). The best season for collecting these insects is before sunrise and just before the setting-in of the monsoon. They should be killed by ammonia, steam of boiling vinegar,

or sulphur dioxide or by heat, and thoroughly dried in the sun and preserved in well-stoppered bottles. "Most of the cantharidin exists in the free state and only a very minute quantity is in combination as salts". "M. pustulata yields about 2.9 per cent cantharidin as compared to the maximum yield of 1.9 per cent from Chinese beetles; the yield from Chinese beetles is even less (1.2 p.c. approximately)." The dried insect is used in medicine; it contains a fatty acid 'cantharidin' 1 to 2 per cent. 'Cantharidin' is a colourless crystalline lactone derived originally from the dried Spanish beetles known as "Cantharis vesicatoria". "The bye-product ethyl-acetate can be obtained from M. pustulata available in India in large quantities" (Chopra). Its tincture (1 in 80) and liquor (1 in 10 of acetic acid) are used. Dose of the tincture is 5 to 10 minims. As a vesicant it is very powerful and acts without pain and without irritation of the urinary organs. It is very efficient substitute as a vesicant for the well-known European drug Cantharides or Cantharidin. Other blistering flies exist in many parts of India, and Mylabris pustulata (*Eng.*—Cantharides; *Hind.*—Teleni-makhi; internally stimulant and diuretic; externally a powerful and valuable counter-irritant and vesicant), and Mylabris indica etc., in the Peninsula. Telini fly or Cantharidin contained in it is generally used in the form of plaster for its counter-irritant, rubefacient and vesicant properties. Cantharidin is contained in more than a dozen Western medicinal preparations, most of which are meant for external application. Owing to its irritating properties, internal administration is not common but in small doses it has been often used, alone or in combination, in such diseases as lupus cystitis, incontinence of urine, spermatorrhoea, etc. Its use as an ingredient of hair-lotions, hair-oils and several other cosmetic preparations like pomades etc., appears to be getting more and more popular every year. The plaster is prepared as follows:—Take Telini fly finely powdered, white or black dammar, beeswax, and suet (mutton of goat) of each two ounces; liquify the three latter with a gentle heat, then remove from the fire and sprinkle in the Telini; mix the whole thoroughly and continue to stir the mixture while it is allowed to cool.

---

## 93. MYTILUS MARGARITIFERUS

### or Pinctada margaritifera

(Class:—Mollusca)

*Sans.*—Mukta; Maracata; Muktikam. *Eng.*—Pearl. *Arab.* —Looloo. *Pers.*—Marwarid. *Ben.*—Mokta. *Hind. Guj. Mah. Ben.* & *Kon.*—Moti. *Tam. Can.* & *Sinh.*—Muttu. Tel.—Mutiamu.

Source.—Found in general molluscs inhabiting shallow seas and sand-banks.

Characters.—Pearl mussel has nearly a semi-circular shell, greenish without and ornamented with the most beautiful nacre within. The nacre is employed in the arts and fine pearls are produced from the extravasation of nacre.

Purification & Preparation.—Pearls are purified—(1) by being boiled in the juice of the leaves of Sesbania aculeata or of the flowers of Agati grandiflora; then prepared for medicinal use by being calcined in covered crucibles and finally reduced to powder. (2) "Powdered pearl is to be rubbed with the juice of Rumex vesicarius and then transferred inside a lemon and stowed in a mass of paddy. At the end of a week it is heated in a crucible and liquefied".—(Sir P. C. Ray's H. of H. Ch., Vol. I, p. 103). Dose of the powder is 2 to 6 grains.

Action.—The power (ash) is highly stimulant, tonic and aphrodisiac. Other medicinal virtues ascribed to pearl are "laxative, sedative, emetic and nutritive." Pearl ash is chiefly carbonate and oxide of lime and acts also as an antacid.

Uses.—The powder is used in heart-burn and bilious affections. *Mukta-bhasma* is useful in cough, phthisis and asthma, given twice a day with honey. Its chief use is in low fevers giving rise to burning sensation in the eyes, palms and soles, so common in India. It reduces the yellowish tinge in the conjunctivae and in the urine due to low fever and checks the burning during micturition. It is also used as a cerebral tonic in nervous diseases as chronic headache, epilepsy and other convulsive attacks. It is used in piles also, in leucorrhoea and spermatorrhoea and impotence. The powder is one

of the ingredients in numerous Indian preparations used for impotence, heart disease, consumption etc. *Pittantaka rasa* described in Rasendrasarasangraha contains it together with several other substances and is a medicine useful in diseases supposed to be caused by deranged bile *(pitta)* such as dyspepsia, jaundice, biliousness, vomiting of bile etc. It is made up of nutmegs, mace, *jatamansi* root, root of Aplotaxis auriculata, *talispatra,* aconite, iron pyrites, iron, talc and realgar one part each, prepared pearls equal in quantity to all the above ingredients beaten together into a paste with the aid of water and made into four-grain pills. Another preparation containing pearls and known as *Vasantakusumakara rasa* (See "Corallium rebrum") is given with sugar, honey and ghee in urinary diseases, impotence, gleet, diabetes, consumption and general debility. This medicine is a valuable alterative tonic in chronic gonorrhoea and spermatorrhoea and much prescribed in these complaints in combination with an extract called *Kusavaleha.* For consumption and other chest diseases a compound preparation made up of prepared pearl and mercury taken in equal parts, triturated well in honey and water and then the whole mass dried over a sand bath till all the water has evaporated is recommended and given with sugar; the dose of the medicine is 1 to 3 grains. For seminal weakness a compound pill made up of *Mukta bhasma,* Panitis succenifer (succinum) 2, Red coral *bhasma* 2, nux-vomica 6, Daronicum scorpioides 15, Borneo camphor 10, cardamoms 15, Cinnamomum tamala 12, cloves 10, *Zande bidastara* (dried testicles of the beaver) 10, dry ginger 12, long pepper 10, musk 12 and sugar 50 parts, mix and make a pill mass; the dose is grains 10 to 15. *Dava-ul-mulk* is a confection made up of 29 ingredients, among which the important are pearls, amber, silk cocoons, silver leaves and musk. It is a nervine tonic giving strength to cardiac muscles and to the central nervous system. It is very useful in functional affections of the heart. Dose is ⅛ to ½ tola given twice a day with milk. "This was given to a patient suffering from neurasthenia in ¼ tola doses. It did give tone to the nerves of the patient"—(Ind. Drugs Rept, Madras). *Javarish-i-lulu* is another preparation containing pearls, zedoary, Daronicum scorpiodes

and cinnamon each 2 parts, Aquilaria agallocha, cocoons of silk moth, cardamoms, saffron and cloves each 1 part, dried testicles of the beaver and *jatamansi* each ½ part and honey sufficient quantity, is used as a tonic and aphrodisiac. It is also given to prevent abortion. Dose is ½ to 1 drachm. In doses of 1 to 2 drachms it is useful in paralysis, asthma, epilepsy and impotence. A compound powder made up of *Silajit, Loha bhasma* and *Moti bhasma* each 2 parts, *trikatu* 3 parts and *triphala* 4 parts, is used in general debility, leucorrhoea, diabetes etc. Ancient Hindu alchemists used to prepare a powder of pearl compound with following constituents:—Pearl, sulphur, powder of iron, copper and silver, all *killed* by being roasted with sulphur.—(Sir P. C. Ray).

---

## 94. ORYCTOLAGUS CUNICULUS

**(formerly Lepus ruficandatus, Geoff.) (Rabbit).**

---

## 95. OS SEPIAE

(internal shell of Sepia officianalis, Family:—Cephalopoda) belonging to Mollusca Class.

(*Sans.*—Samudraphena. *Eng.*—Cuttle-fish bone. *Ger.*—Kuttelfishbeim. *Hind.*—Darya-ka-kaf. *Pers.*—Zuddulbaher kafdarya. *Guj. and Mah.*—Samudraphina. *Tam. and Mal.*—Kadal noray. *Can.*—Samudranaligay. *Tel.*—Sorupenka; Samudrapunuragu) is often found floating on sea-water. It is 1 to 3 inches in width and 5 to 10 inches in length. The skeleton is an oblong, elliptical or oval, flat substance, of whitish colour, very hard and brittle. It can be easily scratched with the nails and is highly pulverisable. It contains calcium carbonate 80 to 85 per cent, also phosphate and sulphate with silica. It is antacid like chalk; also astringent and local sedative. When powdered it is used as a dusting powder to relieve the pain of ear-ache or in otorrhoea. Its *paste* made with lime-juice is usefully applied in itches and other skin diseases; also with rose water to the body in

prickly heat. The powder is an ingredient of tooth-powders. A *medicated oil* prepared by boiling fine scraping of the bone in sweet or sesamum oil is useful for dropping into the ear in otorrhoea. A thin *paste* made of cuttle-fish bone and rock-salt in rose water is a useful application to the eyes in conjunctivitis.

---

## 96. OSTREA EDULIS, Linn.

**or O. gryphoides, Schl.** (Common Indian species)
**& O. Virginiana**

(*Eng.*—Common Oyster shell; bivalve shell. *Fr.*—Nacre. *Ger.*—Osteon. *Port.*—Ostras. *Hind.*—Sipi. *Guj.*—Kalu) is a shell found in the Atlantic and Indian Ocean coasts. It has a small, hollow, ovate excavation in which the animal with a soft, fleshy suborbicular body is enclosed. The shell has a sort of hinge at one end and opens into two valves; one shallow and the other deep which is found adhering to the rock. The shell is hard, externally grey or dark-brown and rough and marked with lateral undulated streaks and internally white, smooth and shining. It contains calcium carbonate 85 to 95 per cent, phosphate and sulphate of calcium and magnesium, oxide of iron, alumina and silica. The inner layer is chiefly used in preparing the ash, called *Kalu bhasma.* The *ashes* are antacid and alterative and used in cases of diarrhoea and chronic intestinal disorders. Dose is 5 grains. The animal is supposed to possess aphrodisiac properties and is therefore eaten raw or cooked. A paste of the shell is used as an absorbent for the same purposes as other shells. *Mother-of-pearl* (*Sans.*—Jaladima. *Ben.*—Jalasukti, Jhinuk) is another species of mollusc, the shell of which is used for the same purposes as oyster shell. *Mukta-Sukti* (*Eng.*—Pearl Oyster. *Ben. & Hind.*—Mukta-Jhinuk. *Mah. Kon. & Guj.*—Motisimp) is another kind of shell which produces pearl. Medicinally its flesh is "acrid, demulcent, excitive of digestive fire, palatable and beneficial in phthisis, *sula* and diseases of heart"—(N. N. Sen Gupta). The shell is used in medicine after purification and reduction. Its ashes (*Sukti-bhasma*) are beneficial in *sula,* dyspepsia, abdominal tumours, liver and spleen enlargements,

and loss of appetite. The *lime* obtained by burning the hard cover of it possesses the same properties as that of ***Sukti-bhasma***, ***Jalasukti*** (*Eng.*—Oyster. Ben.—Jhinak) is a kind of aquatic animal. Its flesh is "acrid, demulcent, stomachic, digestive, cardiac, generative of the inclination for food and beneficial in abdominal tumours, *sula* and diseases of poison"—(N. N. Sen Gupta).

---

## 97. OVIS ARIES

(N.O.—Ovis—Family:—Bovidae).

(*Sans.*—Mesha. *Eng.*—Goat. *Hind. Ben. Duk. Guj.* & *Mah.*—Bhakra. *Kon.*—Bokodu. *Tam. Can.* etc.—Aedu) is an animal of ruminant and mammal class, covered with thick wooly hairs. The flesh of it is "sweet, refrigerant, heavy of digestion, flatulent, nutritious and excitive of bile and phlegm" —(N. N. Sen Gupta.). See also Adeps Lanae and Sevum Praeparatum.

---

## 98. OVIS VIGNEI, Bath.

(*Eng.*—Sheep. *Sans.*—Abika; Mesha. *Ben.*—Bhera; Mesh). Flesh is difficult to digest, excitive of bile and phlegm. Urine is stimulant and beneficial in leprosy, piles, "*sula*", dropsy, oedema and gonorrhoea.

---

## 99. PALAEMON CURCINUS, or P. Lar. Linn.

(*Eng.*—Prawn. *Sans.*—Chingati. *Ben.*—Chingri). Flesh is difficult to digest, constipating, cardiac stimulant, phlegmatic, beneficial in obesity, bile and vitiated blood. Highly esteemed with curry.

---

## 100. PASSER DOMESTICUS

(*Eng.*—House Sparrow. *Sans.*—Chataka. *Hind.*—Charanja. *Ben.*—Charai-pakhi). Flesh is palatable, refrigerant, demulcent, cardiac stimulant and aphrodisiac.

---

### 101. PAVO CRISTATUS, Linn.

(*Eng.*—Peacock. *Sans.*—Nilkantha. *Hind.*—Mur. *Ben.*—Maur. *Bom.*—Mur. *Tam.*—Mail). Flesh is used for contracted limbs. Grease is used medicinally.

---

### 102. PERDIX SYLVATICA

(*Eng.*—Common Indian Partridge. *Sans.*—Krakara. *Hind.*—Kayar. *Ben.*—Karkati. *Bom.*—Kardhanka). Flesh is cardiac stimulant; improves memory and digestion, useful in wind, bile and in epistaxis.

---

### 103. PHALACROCORAX NIGER

(*Eng.*—Diver. *Sans.*—Valakaka. *Ben.*—Pankauri). Flesh is demulcent, difficult to digest, refrigerant, and alleviative of "*vayu*".

### 104. PHASIANUS—See allus bankiva, etc.

---

### 105. PHYSETER MACROCEPHALUS—See Cetaceum.

---

### 106. PINCTADA MARGARITIFERA, Linn.

**See Mytilus margaritiferus.**

---

### 107. PISCES

(*Eng.*—Fish. *Sans.*—Matsya. *Hind.* & *Ben.*—Machchi. *Mah.*—Maslee. *Kon.*—Maslee, Jhalkay. *Tam. Can.* & *Mal.* Meenu) is an aquatic vertebrate animal with gills and fins inhabiting the waters of oceans, rivers, lakes, wells, etc. In Ayurveda different properties have been ascribed *not only to different fishes, but of the same fish living and growing in different waters.* Fish from different sources are also recommended to be taken in different seasons as follows:—

**_Properties of Fish from different sources:_—(1) River fish is sweet to the taste, heavy of digestion, checks _Vayu,_ deranges _pitta_ and blood, heating and increases faecal refuse (causes**

bulky stool); (2) Shallow-water fish is sweet but deranges *pitta;* (3) Tank and Pond fish is palatable and checks *Vayu Pitta;* (4) Large lake fish is difficult to digest (heavy of digestion); (5) Fish near spring-water is similar in properties to No. 4; (6) Well-water fish deranges *Kapha.*

*Fish from different sources to be taken in different seasons:*—(1) Fish from wells—in early winter. (2) Fish from pond—in late winter. (3) Fish from river—in Spring. (4) Fish from pond and tank—in Summer. (5) Fish from lakes—in Rains. (6) Fish near spring water—in Autumn.

*Properties & Uses of different fishes:*—*Arlus arius,* Ham. & Buch. (*Sans.*—Ari-matsya. *Ben.*—Armach); flesh is difficult to digest, demulcent, cardiac stimulant, improves memory, wind and phlegm. *Ban fish* (Indian Eel) checks *Vayu-Pitta,* is light and appetising. *Barbus sophore,* Ham. & Buch. (*Eng.*—Mahseer. *Sans.*—Proshti. *Ben.*—Punti-machh). Flesh is sweetish bitter, demulcent, antiphlegmatic, alleviative of *vayu;* beneficial in the diseases of mouth and throat. *Boyal fish* (Scioenidus Pama—Whiting) is carnivorous, increases *kapha,* is strengthening, induces sleep, increases *pitta* and deranges blood; if continued for sometime it induces leprosy and other skin diseases of the group (vide Hutchinson's fish theory of leprosy). *Bhetki fish* like sea-fish checks *vayu-pitta* and increases *kapha. Callichrous pabda.* Ham. & Buch. (*Eng.*—Butterfish. *Sans.*—Parbata. *Ben.*—Pabda); flesh is demulcent, cardiac, stimulant, and carminative. *Catla-catla,* Ham. & Buch. (*Eng.*—Telescope-fish. *Sans.*—Katala. *Ben.*—Katala); Flesh is stimulant, difficult to digest; beneficial in disturbances of the three humours. *Carchardon carcharius,* Linn. (*Eng.*—White Shark), Oil is richer in iodine and phosphorus than cod-liver oil, but contains less bromine and sulphur; oil is a substitute for cod-liver oil. *Hilsa fish* (Indian herring) is very sweet to the taste, due to excess of fat, deranges *Tridosha. Anabas scandeonus.* (*Eng.*—Climbing perch. *Sans.*—Kabayee. *Ben.*—Kai or Koi. *Hind.*—Kabai). Flesh is astringent, demulcent, easily digestible, sweet, soothing, appetiser, checks *vayu,* increases *pitta* very slightly; cardiac stimulant. *Clarias batrachus,* Linn. (*Eng.*—Catfish; Magur. *Sans.*—Madgura). Flesh

is demulcent and is used in diarrhoea; light and strengthening, checks *vayu,* increases *kapha* slightly. *Clupea ilisha,* Ham. & Buch. (*Eng.*—Sabli-fish. *Sans.*—Illisa. *Hind.*—Hilsa. *Ben.*—Ilis). Flesh is demulcent, stomachic, bilious, phlegmatic and carminative. *Mourola fish* (Opio cephalus or Serpent-head) is tissue-producing, vitalising and galactagogue. *Mugil planiceps,* Cuv. & Val. (*Sans.*—Bhokani. *Ben.*—Bhangan); flesh is refrigerant, phlegmatic, difficult to digest. *Nata* or *Gorai fish* is sweet, bitter, astringent, checks *Tridosha,* is appetiser, light, strengthening and good in goitre. *Punti fish*—large variety—is slightly bitter but sweet, cooling, appetising and checks *pitta* and *kapha;* small variety—is very bitter, pungent, very slightly sweet, light and checks *vayukapha.* *Rohee* or *Rohu fish* (Labea rohu; or Labeo rohita, Ham. & Buch. (*Sans.*—Rohita. *Hind.*—Rahu. *Ben.*—Rui-machh. *Tam.*—Eraminu) is the best of all fresh water fishes; flesh is sweet to the taste but slightly bitter, increases vitality, checks *vayu* but increases *pitta.* Flesh is astringent, slightly stimulant, difficult to digest, demulcent, cardiac stimulant, strengthening, slightly bilious, beneficial in vitiated wind. Its bile is laxative and is useful in bilious remittent fever. *Scomberomorus commersonii,* Lacep. (*Eng.*—Seir fish. *Hind.*—Surmoyi. *Tam.*—Konam). Used as a substitute for cod or shark oil. *Shole fish* is astringent, slightly sweet and good to taste. *Singhi fish* (Sacchobranchus fossilis, Bloch.); (*Sans.*—Sringi. *Ben.*—Singi). Flesh is demulcent, easily digestible, cardiac stimulant, aphrodisiac, galactagogue. Used in dropsy, jaundice, bile, phlegm and wind; checks *vayu,* deranges *kapha,* is soothing, bitter, astringent, light and appetiser. *Tangra fish* (Macrones Tangra, another variety of Cat fish) stimulates brain, decreases marrow, is appetising and increases *vayu-pitta.* *Fish eggs* are very vitalising and soothing, tissue-repairer, light, increases *kapha,* increases marrow and strength and is good in urethral discharges. *Trichogaster* fasciatus, Bl. Schn. (*Eng.*—Fish. *Sans.*—Khalis. *Ben.*—Khalse). Flesh is astringent, constipating, produces wind and alleviative of "*sula*".

*Preparations from Fish:*—(1) *Sutki fish*—dried in the sun for preservation. It is difficult of digestion, constipating and

not strengthening. (2) *Burnt fish*—outer layer is burnt on charcoal when the inner flesh becomes more easily digestible, good and strengthening. (3) *Fish Soup* is contra-indicated after "*Kapha*" or "*Vayu-Kapha*" derangement causing diarrhoea. When indicated, the various fishes recommended are small white fish like "*Mourola*" or black fish like "*Singhi*", "*Kai*" or "*Koi*", or "*Magur*". (4) *Fish-liver oil.*

Analysis of some Fish:—

| Name of Fish | Percentage of Nitrogen | Fat | Salt |
|---|---|---|---|
| Rohu fish | 17.5 | 16.4 | 2.36 |
| Magur fish | 18.9 | 5.0 | 1.80 |
| Kai fish | 23.6 | 2.84 | 2.99 |
| Singhi fish | 24.56 | 4.26 | 2.73 |
| Ban fish | 17.9 | 28.4 | — |
| Tangra fish | 17.2 | 0.3 | 1.3 |

Fish, therefore, contains less proteid generally than beef or goat's meat except *Kai* and *Singhi* (cat fish). It is more easily cooked and easily digested except those which contain much fat, e.g., big *Rohu, Hilsa* or Indian Herring, *Ban* or Indian Eel, etc.—(Dr. Ashutosh Roy, "Jour. of Ayur." March 1926).

---

## 108. PSITTACULA KRAMERI, Scop.

(Family:—Psittacidae).

(*Eng.*—Parrot; *Sans.*—Sukha; *Ben.*—Tia). Flesh is easily digestible, refrigerant, stomachic, cardiac-stimulant and constipating; beneficial in cough and phthisis.

---

## 109. PYTHON RETICULATUS

(*Eng.*—Gall-bladder). Used medicinally.

---

## 110. RANA TIGRINA (Frog) & BUFO MELANOSTICUS (toad).

(*Sans.*—Bheka. Ben.—Byang). Flesh is cardiac-stimulant, phlegmatic, slight bilious; alleviates thirst, gonorrhoea, phthisis, leprosy and vomiting.

---

## 111. REPTILIA

(*Eng.*—Reptiles). Lizard; Serpent Poison; Gecko verticillatus, *Laur;* Mabuia carinata, Schneid; Varanus bengalensis, *Daud*, Varanus salvator; all these have been separately and independently dealt with in their respective alphabetical order.

---

## 112. RHINOCEROS UNICORNIS, Linn.

(*Eng.*—The great one-horned Rhinoceros. *Sans.*—Khargee. *Ben.*—Gandar). Flesh is astringent, difficult to digest, nutritious and cardiac stimulant; alleviative of vomiting and epistaxis.

---

## 113. SACCHARUM LACTIS (Milk-sugar)

See Lactose under "Lactus".

---

## 114. SANGUISUGA MEDICINALIS (The Speckled Leech)

(See:—Hirudo Medicinalis.)

---

## 115. SCILLA SERRATA

(*Eng.*—Crab. *Sans.*—Karkataka. *Ben.*—Kankra). Flesh is antibilious, diuretic, laxative, haematinic, cardiac stimulant and alleviative of '*vayu*'.

---

## 116. SEPIA OFFICINALIS (Cuttle-fish)

(See:—Os Sepiae & Cephalopoda).

---

## 117. SERIPARIUM

(*Eng.*—Rennet or Rennin; *Hind.*—Paneermaya; Pes). See:—B.P.C.

---

## 118. SERPENT POISON

*Sans.*—Sarpavisha; Garala. *Eng.*—Cobra-venom; Snake-venom.

U. C. Dutt says that it has been used in Hindu medicine since a very recent period only. Because prescriptions containing it or references to it are found in modern works only, such as Bhaishajya Ratnavali, Sarkaumudi, etc. "Although the venoms of other snakes are mentioned, the venoms of the Indian cobra and Indian viper have been chiefly used."[1]

The poison of the black cobra is collected:—(1) by making reptile bite on a piece of stick or wood when the poison is poured out and received on a piece of plantain leaf; (2) "by forcing open the jaws and squeezing the glands into a sterile petri dish or by making the reptile bite a petri dish with a rubber membrane stretched over it".[2] It is preserved in two ways. The liquid poison is allowed to congeal and dry in a cup or it is rubbed with a fourth part of mustard oil and spread out on a piece of plantain leaf. Thus treated it rapidly coagulates into a granular agglutinated mass of a yellowish-brown colour. When allowed to dry spontaneously, "or under a bell jar in the sun or over concentrated sulphuric acid, serpent poison loses 50 to 70 per cent of water"[3] and coagulates into shining, "crystalline yellowish-white granules, which can be powdered. "The dried venom retains all the properties of the fresh venom".[4] Cobra Poison of "Indian Cobras:—*Naja tripudians* and *Naja bungarus* are the two formidable varieties out of the several met with in India. *Naja naia vel tripudians* species is distributed throughout the whole of Southern Asia from the south of the Caspian Sea to south of China, India and the Malay Archipelago. *Indian vipers:*—Two poisonous snakes belonging to this group commonly occur in India: (1) *Daboia russelli vel elegans,* found all over the

plains of India, particularly in Ceylon, Siam, Burma, Rajputana & Bengal; Kulu and Kashmir valleys at an altitude of 5,000 to 6,000 ft. though generally it is an inhabitant of plains and valleys up to 2,000/3,000 ft. (2) *Echis carinata* is another viper frequently met with in India—N.W.F. Province, Baluchistan, the Punjab, Sind, Rajputana, Central India and some parts of Madras and Ceylon".[5] Of cobra poison, Dr. H. C. Sen says "when fresh it is a clear transparent fluid, varying in colour from a yellow to a straw tint to complete colourlessness. It has a faintly acid reaction; its consistence varies from that of water to that of the white of an egg. Its specific gravity has a wide margin of variation. Specimens taken from several cobras and mixed gave a specific gravity of 1.058. It has a very bitter taste, which is chiefly perceived along the margin of the tongue, and a faint sickly odour. *Daboa venom* is, however, without this bitter taste. When cobra poison is evaporated, it loses from 50 to 75 per cent of water, and a yellowish substance, easily pulverisable, resembling gum arabic or dried egg albumen, is left behind. This dried substance possesses all the physiological properties of cobra poison, and it can be kept in this state for years. Chemically analysed by Dr. Armstrong the snake poison is found to contain Carbon 45.76; nitrogen 14.3; hydrogen 6.8; sulphur 2.5. When kept in the liquid state, cobra poison quickly becomes, first neutral and then alkaline, and a few feathery and cubic crystals will form. "When kept in hermetically sealed ampoules in a cool dark place, it retains its potency for a long period".[6] If preserved in a loosely corked test-tube, it will become cloudy, smell offensively and will swarm with bacteria in active movement; but it will still remain poisonous. The alkalinity now lessens and the reaction again becomes acid and the fluid then coagulates into a firm whitish, opaque substance, somewhat like the coagulated white of an egg, but of a lemon colour. If a small quantity of fluid is left uncoagulated it is poisonous and the washings of the coagulum are also poisonous. When water is added to the coagulum decomposition rapidly sets in, and the products cannot be distinguished from those of any other similar organic body. The changes are greatly dependent on the physical conditions to which the poison is subjected.

Coagulation occurred in some poison kept at 29°C. in 10 days, whereas weeks were required when the temperature was 20°C. "Of all the stimulants" Dr. Sen states "the fresh venom obtained from strong, young, black cobra is regarded as the most powerful, and its effects more lasting than those of other stimulants.

Physical & Chemical Characteristics.—The venom is composed of variable amounts of proteins, albumoses, pigments, mucus, epithelial debris, fatty matters, salts like chlorides and phosphates of calcium, ammonia and magnesium, analogous to the constituents of normal saliva.

The chemical nature of the venom, however, is very variable and uncertain. It resembles protein in its reactions since it can be precipitated with alcohol, tannins, etc., and does not diffuse through the dialysing membrane. Armand Gautier (1883) believed that the venom contains an alkaloid, which could be separated out by pulverising the venom with carbonate of soda and systematically extracting the mixture with alcoholic ether at 50°C., but other workers have not succeeded in separating any alkaloid. Mitchel and Reichert (1884) showed that the cobra venom consists of 98 per cent of albumin and only 2 per cent of globulin. Viper venom on the other hand consists of nearly 25 per cent globulins.

According to Martin and Smith (1892) the cobra venom albumoses can be fractionated into hetero-albumoses, proto-albumoses and deutero-albumoses, but the albumins contained in it are devoid of all toxic power. Many chemical substances like 1 per cent solution of potassium permanganate, gold chloride, chloride of lime and even hypo-chloride of calcium (1 in 12), chromic acid, bromine water, 1 per cent, trichloride of iodine, modify or delay the action of venom. There has been much discussion regarding the nature of the toxic principle in the different venoms (1902). According to Faust (1910-1911) the chief toxic substances in the cobra and rattle-snake venoms are some non-nitrogenous principles. These are not glucosides but otherwise resemble saponins in their physical, che-

mical and pharmacological properties. They are responsible for its action on the central nervous system. Cobra venom can stand the temperature of 100°C. for a short time without losing all its activity. The toxicity of the cobra venom is not modified by filtration through a porcelain candle, while that of viper venom is altered considerably. In this way the non-diffusible albuminoid coagulable at 82°C., and diffusible non-coagulable albumose can be separated. The former which produces haemorrhages has been called *haemorrhagin* and the latter which acts on the nerve cells of the respiratory centre has been called *neurotoxin.* Most of the colubrin and viperin snake poisons contain the haemolytic principle. In general it may be said that the first effect of the venom is to produce agglutination of the erythrocytes followed by their solution after a variable interval, which depends on the kind of snake and the potency of the venom. The agglutinating power of the venom is destroyed at a temperature between 75 to 80°C. maintained for 30 minutes. Different venoms differ in their haemolytic power. Cobra venom is the most active in this respect and then follow the venoms of water moccassin, copper head, rattle-snake in the order named. Variations in susceptibility to this reaction are present in different animals. Dog's blood is most quickly and easily haemolysed in high dilutions, while the ox's corpuscles are least susceptible. The intermediate animals are the sheep, guinea-pig, pig and rabbit etc. The variation, it is suggested, is due to variation in the lecithin content of the blood. Ox's blood can be haemolysed even in very high dilutions of the venom in the presence of lecithin. The haemolytic power of the venom is only slightly effected if the venom is exposed to 100°C. for 10 to 15 minutes. Acton & Knowles (1913-14) have shown that most of the venoms consist of (a) *haemorrhagin* which has the property of destroying the endothelial cells lining the finer blood vessels and of giving rise to ecchymosis and extravasation of blood, (b) a *cytolysin* which dissolves both the red and white blood corpuscles, and (c) a fibrin ferment which causes an intra and extra-vascular clotting leading to pulmonary embolism and death from asphyxia and (d) a *neurotoxin* which acts on the central nervous system as well as on the nerve endings.

The venom is also said to possess the power of destroying the bactericidal properties of the normal blood sera. Welch & Ewing (1894) explained that the rapid putrefaction which sets in in the animals after poisoning with cobra venom is due to this property. This reduction of the bactericidal power of the normal sera is due to the fixation of the serum complement by the venom. The venom has no action on the intermediary body of the serum. Calmette's antivenin has the restraining action upon the venom haemolysis and venom bacteriolysis.—(Chopra's "I.D. of I." pp. 440-442).

Pharmacological Action of Cobra Venom:—It was believed that the action of the cobra and viper venoms was the same and that the divergence of symptoms noticed in the two cases were only due to the difference in the degree of toxicity. It was suggested later that these two venoms have entirely different seats of action. Epstein (1930) studied the action of the South African cobra, *Naia flava (Naia vivea)* and found that it produced death by respiratory failure. The venom also has a direct action on the involuntary muscles, contraction being followed by relaxation. Chopra & Iswariah (1931) have made a pharmacological study of the action of the venom of the Indian cobra, *Naia naia* vel *tripudians.* The M.L.D. of the venom varies with the species of the animals; cats and rats are less susceptible; dogs, rabbits and man are more easily affected. When given intravenously the venom produces an immediate effect, the animal dying within a few minutes of respiratory failure provided a large enough dose is given. The absorption is slower when the venom is given by the subcutaneous and intra-muscular routes, death taking place in 4 to 24 hours. The venom is not absorbed at all from the gastro-intestinal tract or other mucous membranes. The venom has no effect on the activity of salivary, gastric and pancreatic secretions of man *in vitro.* It slightly increases the tone of the musculature of the gastro-intestinal tract in cats and rabbits.

Injections of sub-lethal doses of the venom produce a small but persistent rise of blood pressure in experimental animals. This rise is not due to any stimulant action on the accelerator mechanism of the heart or on the myocardium. None of the

concentrations of the venom, however high or low, produce definite stimulation of the heart especially when it is failing. Very large doses appear to act directly on the heart producing a marked depression and stoppage. The rise of blood pressure appears to be associated with the stimulation of the vasomotor centre in the medulla as it is absent in decerebrated animals. The fall of blood pressure produced by large doses has been shown to be due to paralysis of the vaso-motor centre. The main action of the venom in lethal and sub-lethal doses on the animals is on the respiratory centre, the effect being one of initial stimulation and final paralysis. The venom appears to have no effect on the motor end-plates in the diaphragm or other respiratory muscles. Observations on animals show that the venom produces initial stimulation of the higher parts of the brain followed by paralysis. It has been shown by Chopra & Chowhan (1931) that contrary to the general belief the cobra venom has a toxic action on lower organisms such as the *Paramoecium caudatum*.—(Chopra's "I.D. of I." pp. 442-443).

Pharmacological Action of Daboia Venom:—The venom of Russell's viper produces local abscesses, cellulitis or necrosis of the tissue at the site of the bite. This marked local action is due to large quantities (25 per cent) of the globulins. The systemic effects are haemorrhagic effusions in the splanchnic area and ascending paralysis of the central nervous system. The toxicity of the daboia venom is reduced to one-third when it is mixed with formaline and incubated for some time. It digests fibrin on account of the presence of fibrin ferment, trypsin. Lamb found that viper venom loses its coagulation power when it is heated to 75° to 80°C. The neurotoxic coagulant substances present in it can be precipitated out with alcohol.

There has been a good deal of divergence of opinion regarding the causes of death with Viper venom. Cunningham (1894) reported that death in the animals bitten by Indian daboia is due to its direct action on the central nervous system. Martin (1897) believed the cause of death to be intravascular clotting. Later, Lamb and Hanna (1903) working on the Indian daboia also showed that the death was due to extensive

intravascular clotting. The minimum lethal dose for the rabbit is found to be 0.26 mgm. per kilogram intravenously. Fowls bitten by this viper die within 30 seconds, dogs in 7 minutes and cats in about an hour; the horses die in about 11½ hours. Acton and Knowles (1914) found the minimum lethal dose to be 0.5 to 2.5 mgm. per 100 gms. of the wild rat, death occurring in 8 to 14 hours. In rabbits and guinea-pigs when lethal doses were given the action was not so rapid as is the case with cobra venom. The action appears to be mainly local, the venom being fixed locally on account of the clotting action of the blood. In case of wild rats 8 to 9 mgm. intravenously was fatal in 2 to 4 hours in animals weighing 700 gm. The animal at first showed restlessness, breathlessness and then became dyspnoeic, asphyxial convulsions and paralysis of the hind limbs following. The death occurs owing to respiratory failure, the heart continuing to beat for some time after the respiration stops. Frogs are least susceptible. Chopra & Chowhan (1932) have shown that the viper venom unlike cobra venom has little or no action on the protozoal organisms. In experimental animals the blood pressure falls with a rise in the volumes of the spleen and intestines and with engorgement of the splanchnic blood vessels; the heart dilates at first and then stops in diastole. The effect of the venom appears to be like that of histamine. Saline-infusions and adrenaline injections revive the animal by increasing the blood volume and constricting the systemic blood vessels.

The pharmocological action of the venom of *Echis carinata* is similar to that of Indian daboia. It is marked by intense local inflammation, severe pain and gangrene at the site of the bite. Haemorrhages and sero-sanguinous effusions are found in all the serous cavities—pleura, pericardium and peritoneum. The blood pressure shows an enormous fall, the reflexes are reduced and finally the heart becomes very feeble and stops in diastole.—(Chopra's "I.D. of I." p. 443).

Action.—It is said that the pathological effect of any given venom on man varies with the dose injected, and that though large doses may be lethal, small doses may produce beneficial physiological effects.—(Chopra's "I. D. of I." p. 444).

Uses.—Different kinds of pills containing different proportions of snake venom are used in the collapse stage of fever, cholera and many other complaints from time immemorial. Its use is advised with the fresh juice of sugarcane, by Susruta in the treatment of ascites. It is irritant to the bowels and hepatic stimulant, so most of it is thrown out owing to its purgative action. "Certain classes of people in India take small doses of snake venom habitually by the mouth with the idea that it protects them from the effects of poisons and diseases".[7] It was known to the ancient Hindus that bile mitigates the action of snake-venom. This observation has been verified by Prof. Fraser. In Hindu medical works, many prescriptions contain snake-venom and bile of different animals. In some prescriptions arsenic is advised to be mixed with the venom. This also mitigates its action. Whatever the *modus operandi* may be "I am confident" Dr. Sen says "that snake-venom is a powerful stimulant if administered by the mouth. I have shown Major Gibbons the beneficial effect of snake-venom treatment in many bad cases of plague. Civil Hospital Assistant Nrityalal Mookerjee, then Resident Medical Officer, Cambell Hospital, would not probably have recovered if the snake-venom pills were not administered to him in heroic doses as advised by Major Gibbons. Many men are living who have recovered from plague after the administration of snake-venom pills. Many of them feel the burning sensation even now, and have to put cold water on their head to relieve the burning sensation. I think in cases of blood-poisoning like plague, where red blood corpuscles undergo disintegration as in snake-poisoning, it is safer to use snake-venom by the mouth in preference to hypodermic injections. Dr. Cunningham had shown that snake-venom causes disintegration of red blood corpuscles. *Injection of snake-venom in plague cases should be done very cautiously, for the treatment itself is capable of adding fuel to the fire. I, therefore, prefer to use the venom, mitigated with bile or arsenic, by the mouth".*—(Dr. H. C. Sen). Cobra venom is also said to afford a means of diagnosing cancer—Formachidis Test. This test depends upon the activation by cobra venom of the haemolytic action of serum in the deviation of complement test, and the assertion is that the test oc-

curs only with the serum of persons suffering from malignant disease.—(Chopra). "Fresh poison of the cobra is now recommended in inoperable cancer on the basis of the experiments carried out by Calmette and his disciples. 1/100th mouse-unit is injected at first and the dose then increased to 1/10th; 1 and 5 mouse-units, injected subcutaneously at intervals of 3-6 days, gradually advancing to the proximity of the tumour. The sensation of tension due to the injection disappears immediately. The growth of the tumour is arrested. In several cases complete cures are said to have been effected. My experience in a case of lung tumour (Sarcoma?) was negative".—(Dr. Madaus). In botulism cobra-venom injections have proved of value. Snake-venoms have been recently used in the Western medicine in the treatment of epilepsy, chorea, black-water fever, haemophilia etc.—(Dr. Madaus).

As regards the action of snake venom on blood, whatever its ratio to blood may be, it has been found from experiments made by Dr. Cunningham that a unit of dried venom is capable of effecting at least 156,000 times its weight of blood to such an extent as to interfere with its respiratory property to a fatal extent. Cobra venom not only affects the respiratory property of blood, but likewise its coagulability, and at the same time acts on the red blood corpuscles as their solvent. Wonderful formulae containing snake-venom in different proportions are to be found in the *Rasa Granthas* or Works containing valuable prescriptions with *rasa* or mercury as one of their ingredients. The following are some prescriptions containing snake-venom and their uses—(1) *Suchikabharana Rasa.*—Take of mercury, sulphur, oxide of lead, aconite and cobra venom 1 part each, mix and soak in the bile of the following animals.—(a) *rohu fish;* (b) wild boar; (c) peacock; (d) buffalo; (e) goat. The pills are made of the size of a mustard seed. It is generally administered with the juice of ginger. This prescription is especially indicated in low fevers complicated with looseness of the bowels. The dose is that can be taken up by the point of a needle. (2) *Brihat Suchikabharam Rasa.*—Take of mercury, sulphur, oxide of lead, reduced black talc, aconite and cobra venom equal parts. Soak as above in

the bile of five animals. The pills are generally made of the size of a mustard seed. These are generally administered with cocoanut water. This prescription is very useful in all fevers with brain complications and tendency to cardiac failure; also in cholera, choleraic diarrhoea and obstinate pneumonia. *Cocoanut water should be administered freely.* *Dahi* and soft rice are generally advised as diet, well cooked meat may also be given freely; there is no restriction about diet; the patient may have any food according to his liking. Dr. Sen used to give his patients plenty of *sherbats* (acidulated sugar solutions). To relieve the burning sensation he advised sesamum oil or sesamum paste to be applied to the burning parts. He says it is a mistake to be afraid of baths in these cases; overcautiousness often spoils the action of the medicine. (3) *Aghore Nrisingha Rasa.*—Take of oxide of copper 1 part; reduced iron 1 part; oxide of tin 3 parts; prepared talc 4 parts; *swarna makshik* (iron pyrites), mercury, sulphur, and *manashila* (red sulphide of arsenic) 1 part each; snake venom 4 parts; ginger, long pepper and black pepper, altogether 4 parts, nuxvomica powder 22 parts, and aconite 88 parts; these are to be soaked in the bile of the above animals, *excepting that of goat.* Dr. Sen has used this preparation in chronic malarial fevers. It was particularly useful in those cases *where the liver showed a tendency to cirrhosis.* Cases of malarial fevers which do not yield to the combination of cinchona febrifuge and arsenic are said to yield to this prescription. Often two or three pills suffice to check a very obstinate fever. The patient may have any food to his liking. Baths are strongly indicated. (4) *Ardhanariswar Rasa.*—Take of mercury, sulphur, aconite root and exsicated borax. Rub them together so long as the powder does not become black. Put this inside the mouth of a black cobra; use mud to close the mouth of the cobra. Put this head of the cobra, covered with salt, in an earthen vessel; cover this earthen pot and apply mild heat for 12 hours. When this vessel is cool, take out the medicine and triturate it again. Two grains of this is used as snuff; when introduced into the left nostril the fever of the left side is said to disappear next day; when it is insufflated into the right nostril, this takes away fever from the right side of the body.

Many people believe in its efficacy. If taken internally it produces the same febrifuge effect. It appears that mild heat through thick layers of salt does not destroy the snake venom. (5) *Kalanala Rasa.*—Take of black cobra poison, sulphur, white arsenic, aconite, black pepper, long pepper, ginger, borax, mercury, iron and copper oxides equal parts; soak them in the five kinds of bile as mentioned above, and make into one-grain pill with the juice of datura root. These are given in continued fever complicated with coma, delirium, cardiac and respiratory weakness etc. Dr. Sen further says that there are many other formulae containing different proportions of snake-venom. Snake-venom is said to be inert if administered by the mouth. It is inert as regards producing fatal results, for it is thrown out with the stools, because it is a stimulant to the liver and glands of the alimentary tract. *He says that there are hundreds of cases where snake-venom treatment has produced highly satisfactory results.* Shafa-ul-Imraz states that the blood of a black snake (cobra?) is the best application over the patches of leucoderma.

"In the treatment of epilepsy, the venom is given in doses of 1/200 gr. by hypodermic injections, 3 to 5 such injections being given at 8 days' interval, afterwards two more injections of 1/75 gr. at 14 days' interval. If the symptoms do not disappear another dose of 1/25 gr. is recommended. The dose and the interval of the administration had to be varied according to the age of the patient and the nature of the injury. *Fitzsimons (1929) pointed out that this method of treatment is not free from danger unless the venom is properly prepared by skilled hands.*—(Chopra).

Spangler (1925) used for non-specific therapy intramuscular injections of the protein of the venom of the rattle-snake (crotalin) which contains a peptone and a globulin. He took the degree of eosinophilia produced as a guide to dosage and frequency of administration of the proteins. Usually the highest rise in the percentage of eosinophils following venom protein injections in doses of 1/400 to 1/50 gr. occurs by the second or third day. In from 5 to 7 days after injection, the eosinophils will usually have dropped to 4 per cent or less, and the

patient may be given another injection. The strength of the dose is not increased if a given strength produces an increase of 8 to 10 per cent eosinophils by the second or third day after an injection. By continuing the injections, the rise of eosinophils gradually becomes less, and finally does not exceed normal limits. The patient is then non-specifically desensitized.—(Chopra).

Injections of venom of *Viper aspis* are also said to protect animals against fixed virus of rabies. Experimental work by Chopra and his co-workers has shown that cobra-venom is not absorbed from the gastro-intestinal tract. It is, therefore, difficult to see how the venom given by the mouth can produce the effects it is claimed to produce by the practitioners of indigenous medicine. Besides its irritant effect on the gut, it does not appear to produce any other marked action. As regards the stimulant action of the venom on the circulatory system, it is clear from the experimental data obtained that cobra-venom has no direct effect either on the myocardium or on the accelerator nerves in the heart. It undoubtedly produces a small but persistent rise of blood pressure probably on account of its stimulant action on the vasomotor centre in the medulla when it is given intravenously. This effect would not be produced when the drug is given by the mouth. The margin between the stimulant and the paralytic dose of the venom on the medullary centres is too small to warrant the use of the drug by injection. There also appears to be no rational basis for its use in the treatment of epilepsy, chorea, haemophilia, etc., for which it is given by injection by the practitioners of the Western medicine.—(Chopra's "I.D. of I." pp. 444-445).

(1) to (6)—Chopra's "I.D. of I." pp. 439-440. (7) pp. 444.

---

## 119. SEVUM PRAEPARATUM

(N.O.:—Ovis. Family:—Ungulata).

Snake venom—see:—Serpent poison.

(*Eng.*—Prepared Suet. B.P., *Arab.*—Samin. *Pers.*—Paiyah. *Hind. Ben. Guj. Mah Duk. & Kon.*—Charbi. *Can.*—

Kubbu. *Tam.*—Kozhuppu. *Tel.*—Kovu) is the purified internal fat of the abdomen of the sheep from round the kidneys. It is prepared by cutting the fat in thin pieces, melting, straining and purifying or boiling in water and collecting the floating fat. It is a white, smooth, solid, unctuous mass, harder than lard, of a bland taste without odour, becoming rancid by keeping. It is insoluble in water and cold alcohol; is freely soluble in petroleum spirit. It contains stearin, palmitin and olein; salts of oleic, margaric and stearic acids, with a common base glycerin; also a trace of hercin, some colouring matter, and odorous principles. It is an ingredient base for cerates, ointments, plasters and liniments, which are used as emollient dressings for blisters and as a protective for excoriated surfaces, chapped hands, cracks, fissures etc.

---

## 119A. SNAKE VENOM

**See:—Serpent Poison**

---

## 120. SPONGIA OFFICINALIS or SPONGILLA

(*Eng.*—Sponge. *Arab.*—Ispanga. *Pers.*—Aberamuradepa. *Hind.*—Badala; Mua. *Guj.*—Vadulun. *Duk.*—Badalun) occurs as a light lump of porous nature, yellowish-brown, soft, elastic and irregularly shaped. It is collected by divers from submerged rocks to which it adheres. When quite fresh, it is covered with a gelatinous substance which must be removed to prevent putrefaction. Dry sponge consists of gelatine, albumen and iodine. Its ashes are obtained by burning sponge in a closed vessel. The ashes are used as deobstruent and astringent. Mixed with oil it is applied to swollen glands (goitre) owing to its containing iodine. It is also given internally in dysentery, diarrhoea and bowel complaints. Sponge is generally used for absorbing liquids, cleaning, washing, dilating cavities and for supporting prolapsed parts.

---

## 121. SQUALUS CARCHARIUS

(*Eng.*—White shark) is found on the sea-shores of Indian coastal towns. The oil extracted from its liver is called *Oleum Squalae* (*Eng.*—Shark liver oil. *Hind.* etc.—Machhi-ka-tel. *Tam.* etc.—Meenaennay). It is extracted by boiling *fresh* livers in water. It is a fine, amber coloured oily liquid with a fishy odour and taste like Cod liver oil but more strongly marked and more disagreeable. Left for a time it deposits a white granular substance "stearin" to which the name of *Squalin* has been applied. Dose is 1 to 4 drachms. It is richer in iodine and phosphorous than Cod liver oil, but contains less bromine and sulphur. As emulsion it is used in doses of 1 to 2 drachms three times daily as nutrient, demulcent and alterative, given in cachexia, pulmonary consumption, atrophy of body from any cause, scrofulous affections of the joints and bones especially rickets, scrofulous ophthalmia and scrofulous abscesses, suppurating glands, ulcerations, discharges from the nose or ears and skin diseases; in the mesenteric affections of children with tumefied belly with loose and clavey stools, in their obstinate constipations, in stricture of the rectum, in chronic hydrocephalus, in the advanced stages of spasmodic coughs such as whooping cough and other lung affections and in cholera, epilepsy, neuralgia especially Tio Doulouroux, in chronic rheumatism causing atrophy, in some form of paralysis and in leprosy. In all the above cases the remedy should be persevered for weeks or even longer. *The best time for administering the oil is immediately after or during a solid meal.* Taken on an empty stomach it is almost sure to nauseate. Those who cannot retain it at any other time will sometimes retain a dose if given the last thing before going to bed. For disguising the nauseous taste and preventing subsequent eructations, a good plan is to take a few grains of common salt, both immediately before and after a dose. As a vehicle a little omum water, or a little orange wine, or quinine solution or lime juice or hot strong coffee without milk have been recommended. The vehicle should not exceed a table-spoonful with, at first a teaspoonful of the oil, gradually increased to a tablespoonful, so that the

whole may be swallowed at a single draught. The diet during the course of the oil should be plain and nutritious:—bread, fresh meat roasted or boiled, poultry, game etc., with a fair proportion of vegetables and fruits and a moderate quantity of liquids. All rich articles of food as pastry, fat, meat, cream etc., should be avoided. During its use the patient should be as much as possible in the open air and take gentle exercise.

---

## 122. TACHARDIA LACCA

(N.O.:—Hemiptera; Family:—Coccidae).

(*Eng.*—Lacca. *Sans.*—Laksha. *Ben.*—Gala. *Bom.* & *Tam.*—Lakh). Used in haematemesis and caries.

---

## 123. TURBINELLA RAPA or XANCHUS PYRUM

(*Eng.*—A kind of shell-fish).—See "Gastropoda".

---

## 124. TURNIX m. tanki, Blyth., & Turnix dussumieri, Zemm.

(*Eng.*—Birds called Button-Quails. *Sans.*—Laba. Hind.—Lawa. *Ben.*—Baterpakhi. *Tam.*—Labuwapetta). Flesh is astringent, demulcent, constipating and stomachic; beneficial in disturbances of the three humours.

---

## 125. UNIVALVE—See Gastropoda.

---

## 126. URINE

(*Sans.*—Mutra. *Hind.*—Pesab) of various animals, viz: of (1) Sheep; (2) Goat; (3) Cow; (4) She-buffalo; (5) Elephant; (6) Camel; (7) Horse; (8) Ass; (9) Ox; (10) Human, are used in medicine and their properties are described in Sanskrit works. Of these *cow's urine,* which contains ammonia in a concentrated form, is much used both internally and externally.

Internally it is highly recommended for cirrhosis of the liver in doses of one to two ounces. It is also laxative and diuretic and used in the preparation of various medicines such as *Punarnava mandura*, *Marichadya taila* for enlargements of the abdominal viscera, painful dyspepsia, ascites, anasarca, jaundice, leprosy, chronic prurigo and other obstinate skin diseases. It is recommended by Chakradatta as a vehicle for castor oil given as a purgative. In congestive fever with constipation, chronic malaria, flushed face and headache, an ounce of fresh and warm cow's urine is given as a domestic medicine. It is used *externally* in the purification and roasting of various metals and in the preparation of oils, decoctions etc. *Goat's urine* is given internally as a laxative and diuretic; it is given mixed with a compound decoction of *Jatamans* root, *dasamula* etc., recommended by Susruta in the treatment of epilepsy. Ancient Indian physicians advocated that consumptive patients should sleep with *goats* and inhale the ammonia given off from their urinary excretions.—(Dr. C. Muthu, M.D.). It is also used for fever and headache. Ox's urine (*Sans:*—Brishamutra) is "stomachic and alleviative of jaundice, worms, oedema and diarrhoea". *Horse's urine* is "bitter, stimulant, stomachic, purgative, excitive of bile, alleviative of wind and beneficial in phlegm, ringworm and intestinal worms".—(N. N. Sen Gupta). *Camel's urine* is stimulant, bilious, cardiac stimulant and is useful in dropsy. *Human urine* is stimulant, stomachic, cardiac stimulant. Useful in wind, worms and skin diseases.

---

## 127. VARANUS BENGALENSIS, Daud-Iquana.

(*Eng.*—Monitor. *Hind.*—Gosamp). Used in consumption.

---

## 128. VARANUS SALVATOR

(Eng.—Monitor.) Cures cutaneous disorders.

---

## 129. VIVERRA CIVETTA; V. ZIBETHA; V. RASSE; Lin. of Viverridae family

(*Sans.*—Gandha-marjara. *Eng.*—Civet Cat. *Arab.*—Gatt. *Bom.* & *Hind.*—Ladana; Zawad-bander. *Ben.*—Khatase; Mach-bhander. *Tam.*—Punugu-Puney. *Tel.*—Sawad-puney. *Mah.* & *Kon.*—Punuga-majar. *Can.*—Punugina-Bekku) is a small animal of the feline species found in Malabar, (India) South Asia and Africa, resembling a cat, the semi-liquid, unctuous secretion of which is used in medicine. It is an odorous secretion of musky perfume contained in the pouch of the civet cat, situated between the anus and the genital organs. It is a dark coloured lumpy mass resembling *Rasavanthi* in appearance and consisting of a homogeneous extract mixed with small hair, fibres and pieces of wood and ammonia. Its constituents are free ammonia, resin, fat, extractive matter and volatile oils to which its odoriferous properties are due. It is used medicinally in the form of extract, aromatic pastilles and liniment; the dose of the extract is from 2 to 5 grains. The usual tincture consists of 4 ounces of Civet to 1 gallon of alcohol. It is stimulant, aphrodisiac and antispasmodic given in hysteria and nervous exhaustion. Formerly it was used as an antispasmodic and stimulant, like musk.

Now it is mainly popularly used for perfumery, and in Oriental incenses.

---

## 130. XANCHUS PYRUM

See:—Turbinella rapa.

# THE INDIAN MATERIA MEDICA

---

## APPENDIX I.

Drugs (officinal and non-officinal) according to Therapeutical and Physiological Action.

*N.B.*—Non-vegetable drugs, and the like have been printed in italics.

### ABORTIFACIENTS:—
**(See also:—Emmenagogues).**

Abroma augusta.
Achyranthes aspera.
Aloe litoralis.
Anona squamosa.
Carica papaya.
Crotolaria juncea.
Daucus carota.
Ergot.
Euphrobia resinifera.
Ferula foetida.
Gossypium herbaceum.
*Hydragyrum.*
Luffa echinata.
Morinda citrifolia.
Moringa pterygosperma.
Nerium odorum.
Nigella sativa.
Peganum harmala.
Plumbago rosea, & zeylanica.
Plumeria acuminata.
Pyrethrum indicum.
Santalum album.
ACIDS:—See General Index of synonyms, alkaloids, etc.

### ADIPOGENOUS AGENTS:—

Convolvulous paniculata.
Desmodium triflorum.
Glycyrrhiza glabra.
Gymnema balasamicum & lactiferum.
Leptademia spartium.
Tinospora cordifolia.

### ALKALIES:—

*Calcium salts.*
*Lithium salts.*
*Magnesium salts.*
*Potassium salts.*
*Sodium salts.*

### ALKALOIDS:—Containing plants. (A Few).

Aconitine (Aconitum ferox).
Atisin (Aconitum heterophyllum).
Berberine (Berberis aristata).
Brucine & Strychnine. (Strychnos nuxvomica).
Cannabin (Cannabis indica).
Daturine (Datura fostuosa).
Hyosciyamine, Choline, Hyoscine & Scopolamine. (Hyoscyamus reticulatus).
Margosin (Azadirachta indica).
Nicotine (Nicotiana tabacum).

Nyctanthin (Nyctanthus arbortristis).
Oleandrin (Nerium odorum).
Pangamine (Pongamia glabra).
Piperine (Piper longum; P. nigrum, P. cubeba).
Thebaine, Morphine, Codeine, Narcotine, Papaverine & Landanine (Papaver somniferum).
Ricinine (Ricinus communis).
Vasicine (Adhatoda vasika).
Vernonin (Psoralea corylifolia).

## ALTERATIVES:—

(These comprise some alterative tonics also)—(See also Tonics).

Acorus calamus.
Adhatoda vasika.
Agave Americana.
Albizzia lebbek.
Ammonium chloride.
Aplotaxis auriculata.
Asclepias asthmatica & giganta.
Bauhinia variegata.
Bombax malabaricum.
Bdyonia epigæa.
Calotropis gigantea & procera.
Cassia tora.
Celastrus paniculata.
Cephalandra indica.
China smilax.
Cichorium intybus.
Cinnamomum glanduliferum, & parthenoxylon.
Clerodendron inerme, & serratum.
Coccinea indica.
Cocculus cordifolia.
Echium, sp. of; Ehretia buxifolia.
Embelia ribes.
Eclipta prostrata.
Euphorbia antiquorum.
Fumaria officinalis.
Gynocardia odorata.
Hemidesmus indicus.
Hydnocarpus inebrians.
Hydrargyrum and several of its compound preparations.
Hydrocotyle asiatica.
Ichnocarpus frutescens.
Ipomœa digitata.
Lepidium sativum.
Melia azadirachta.
Mimosa pudica.
Myrica species.
Panax pseudo-ginseng.
Piper longum.
Plantago major.
Podophyllum emodi.
Pongamia glabra.
Smilax China, S. glabra, S. lanceaefolia, S. ovalifolia.
Solanum dulcamara, jacquini, & nigrum.
Spermacosæ hispida.
Sulphur.
Swertia chirata.
Taraxacum officinale.
Tinospora cordifolia.
Tribulus terrestris.
Uraria lagopoides.
Vernonia cinerea.
Vitex negundo.
Withania somnifera.

## ANAESTHETICS:—

Acacia fernesiana.
Acorus calamus.
Camphora officinarum.
Caryophyllus aromaticus.
Datura fastuosa.
Erythroxylon coca.
Ferula asafoetida.
Gymnema sylvestre.
Helleborus niger.
Herpestis monniera.
Melia azedarach.
Nardostachys jatamansi.

Picrorrhiza kurroa.
Saraca indica.

**ANALEPTICS: See— "Nutritives"; "Tonics".**

Bambusa arundinacea.
Bœrrhavia diffusa.
Cocculus cordifolia.
Cynodon dactylon.
Desmodium triflorum.
Emblica officinalis.
Glycerrhiza glabra.
Glycine labialis.
Gymnema aurantiacum, balsamicum, lactiferum & spartum.
Hemidesmus indica.
Hydrocotyle asiatica.
Mimusops elengi & hexandra;
Nymphaea lotus & pubescens.
Phaseolus trilobus.
Prunus amygdalus, communis, domestica, padum, padus & serotina.
Terminalia chebula.
Vanda roxburghii.
Vitis vinifera.

**ANAPHRODISIACS:—**

Agati grandiflora.
Camphora officinarum.
Colchicum luteum.
Hyoscyamus niger.
Myrica nagi.
Nelumbium speciosum.
Nicotina tabacum.
Papaver somniferum.
Saussurea lappa.

**ANODYNES: — (See also: — Hypnotics; Narcotics, Sedatives; Soporifics & Somnifacients).**

Amomum subulatum.
Anisi fructus.
Aquilaria agallocha.
Berberis aristata.
Bombax malabaricum.
Calophyllum inophyllum.
Cedrus deodara.
Curcuma longa.
Datura fastuosa.
Feronia elephantum.
Fœniculum vulgare.
Glycerrhiza glabra.
Hyoscyamus niger.
Myrica sapida.
Nauclea cadamba.
Nelumbium speciosum.
Nymphæa lotus & stellata.
Papaver somniferum.
Saraca indica.
Semecarpus anacardium.
Saussurea lappa.
Shorea robusta.
Typha angustifolia.
Zingiber officinale.

**ANTACIDS:—**

*Apamarga ksharam.*
*Churnodakam.*
*Kadali ksharam.*
Potassii carbonas.
*Sarjaksharam.*

**ANTHELMINTS OR ANTHELMINTICS:—**

(Antiparasitics; Insecticides & Parasiticides; Vernifuges; Helminthics, & their Adjuvants):
(Adjuvants are in Italics).
Acacia anthelmintica or Albizzia anthelmintica.
Achyranthes aspera.
Acorus calamus.
Adhatoda vasika.
Aegle marmelos.
Agropyrum repens.
Albizzia anthelmintica — see Acacia anthelmentica.

*Alkaloids*
Allium cepa & sativum.
Aloe species.
Alstonia scholaris.
Ananas sativus.
Antimony, its compounds & potassium tartrate (tartar-emetic).
Areca catechu.
*Arecoline* (in areca or betel-nut).
Aristolochia bracteata.
Artemisia, absinthium & brevifolia, & cina, & indica, & maritima.
Asclepias curassavica.
Azadirachta indica.
Benincasa cerifera.
Brayera anthelmintica or Hagenia abyssinica.,
Butea frondosa.
Cæsalpinia bonduc.
*Calcium gluconate* & *C. lactate.*
Calotropis gigentea.
Carica papaya.
Carum copticum.
Caryophyllus aromaticus.
Cassia tora.
Canthelminticum, Chenopodium ambrosioides, & C. botrys.
Chrysanthemum cinerariae.
Cinchona officinalis & its alkaloids.
Cinnamomum camphora, C. zeylanicum.
Citrullus colocynthis.
Cleome viscosa.
Clerodendron infortunatum.
Cocus nucifera.
Colycopterus floribunda.
Compounds of Mercury.
Costus speciosus.
Croton tiglium.
Cucurbita maxima, & C. pepo.
Curcuma longa.
Dryopteris filix-mas.
Embelia ribes & E. robusta.
*Enzymes.*
Erythrina indica.
Ferula asafoetida.
Ficus laurifolia.
Garcinia pictoria.
Gardenia Campanulata & G. gummifera).
Gentian violet.
Gisekia pharnacecides.
Hagenia abyssinica — see:— Brayera anthelmintica.
Helicteres isora.
Helleborus niger.
Holarrhena antidysenterica, & H. pubescens.
Hyoscyamus niger .
*Iron & ammonium citrate.*
Juglana regia.
Kaolin.
Legnaria vulgaris.
*Magnesium sulphate.*
Mallotus philippinensis.
Mangifera indica.
*Margosine.*
Melanorrhoea usitatissima.
Melia azadirachta.
*Mineral oils.*
Monarda punctata.
Moringa pterygosperma.
Mucuna pruriens.
Nigella sativum.
Nyctanthus arbor-tristis.
Ocimum sanctum.
*Oleum cajuputi, O. eucalypti.*
Ophioxylon serpentinum.
*Organic acids, their salts and esters.*
*Papain.*
Peganum harmala.
Picraena or Picrasma, excelsa, —see Quassia excelsa.
Pimpinella anisum.
Piper longum & nigrum.
Plantago ovata.
Polyporus anthelminticus.
Pongamia glabra.

Psoralia corylifolia.
Ptychotis ajowan.
Punica granatum.
*Pyrethrins.*
Pyrethrum indicum.
Quassia excelsa.
Quisqualis indica.
Rhamnus cathartica.
*Ricinis communis (oil).*
Ruta graveolens.
Salvadora persica.
*Santonin.*
Sassafras venifolium.
Semicarpus anacardium.
Semi refined or unrefined plant products.
Simgrulla officinalis & S. Amara, & glauca.
*Sodium sulphate.*
*Styrax benzoin.*
Tanacetum vulgara.
Terminalia belerica.
Thymus vulgaris.
Trachyspermum ammi.
Tribulus terrestris.
Vernonia anthelmintica.
Vitex negundo.

## ANTIBILIARY:—

**ANTIBIOTICS:—Refer to several modern synthetic drugs and preparations.**

**ANTICOAGULANTS : — Citrates, Heparin. Hirudin.**

Andrographis paniculata.
Phyllanthus emblica.
Picrorrhiza Kurroa.
Trichosanthes dioica.
Vitis vinifera.

## ANTIDIABETICS:—

Aconitum ferox.
Asphaltum.
Cassia auriculata, fistula and sophora.
Citrus aurantium and vulgaris.
Cocculus cordifolia & villosus.
Emblica officinalis.
Eriodendron aneractuosum.
Eugenia jambolana.
Picus Benphalensis & glomerata.
Gymnema sylvestre.
Lodoices seychellaram.
Mica (bhasmam).

## ANTIDOTES:—

Achyranthes aspera.
Albizzia lebbek.
Aristolochia indica.
Bragantia wallichii.
Cordia myxa.
Curcuma longa.
Dæmia extensa.
Eupatorium ayapana.
Euphorbia neriifolia.
Gymnema sylvestre.
Ichncarpus frutescens.
Leucas aspera.
Notonia corymbosa.
Ophiorrhiza munghos.
Ophioxylon serpentinum.
Pterocarpus santalinus.
Rubia cordifolia.
Salvadora wightiana.
Strychnos columbrina, & S. potatorum.
Trichodesma indicum.
Vitex negundo.

## ANTIDYSENTERICS:—

Holarrhena antidysenterica.

## ANTIEMETICS:—

Andropogon muricatum.
Citrus medica.
Cynodon dactylon.
Erythroxylon coca (*cocaine*).
Eugenia jambolana.
Hordeum vulgare.

Mangifera indica.
Melia Azedarach.
Myrtus caryophyllus.
Punicum granatum.
Strychnos nuxvomica.
Zizyphus jujuba.

**ANTIGALACTAGOGUES:**

Cedrus deodara.
Cocculus cordifolia.
Cyperus rotundus.
Hemidesmus indicus.
Holarrhena antidysenterica.
Picrorrhiza Kurroa.
Stephania hernandifolia.
Zingiber officinale.

**ANTIMALARIAL:**
**(Or ANTIMALARINAL).**

Allium sativum.
Andrographis paniculata.
Berberis aristata.
Caletropis gigantea.
Cinchona calisaya & C. ledgeriuna, C. officinalis, C. succirubra, etc.
Eclipta erecta.
Picrorrhiza kurrooa.
Piper nigrum.
Vitex negundo.

**ANTIPARASITICS:—See also Vermicides; Paraciticides; Anthelmintics.**

Acacia catechu.
Achyranthus sativum.
Acorus calamus.
Albizzia lebbek.
Allium aspera.
Alstonia scholaris.
Amomum subulatum.
Andropogon citratis.
Anona squamosa.
Anthemis nobilis.
*Antimony sulphide.*
Aplotaxis auriculata.
Argemone Mexicana.
Arsenous bisulphuret & trisulphuret.
Baliospermum montanum.
Balsamodendron pubescens.
Berberis aristata.
Bryophyllum calycinum.
Calotropis gigentea.
Camphora officinarum.
Carum copticum.
Cassia alata, tora, sophora, fistula.
Cedrus deodara.
Cinnamomum cassia.
Cleome viscosa.
Cocculus suberosus & cordifolia.
*Copper sulphate.*
Coriandrum sativum.
Curcuma longa.
Cyperus rotundus.
Datura fastuosa.
Embelia ribes.
Emblica officinalis.
Erythrina indica.
*Ferri sulphas.*
Ficus benjamina & glomerata.
Gardenia gummifera.
Glycerrhiza glabra.
Holarrhena antidysenterica.
Indigofera tintoria.
Ipomœa turpethum.
Jasminum grandiflorum.
Jatropha curcas.
Justicia adhatoda.
Kalanchoe laciniata.
Luffa amara.
Mallotus philippinensis.
Melia azedarach.
Moringa pterygosperma.
Myrica sapida.
Nardostachys jatamansi.
Nerium odorum.
Nicotina tabacum.
Ocimum basilicum.

Piper cubeba, P. longum, & P. nigrum.
Pongamia glabra.
Pterocarpus santalinus.
Punica granatum.
Quassia excelsa.
Randia dumetorium.
Ricinus communis.
Salvadora persica.
Saussurea lappa & auriculata.
Semicarpus anacardium.
Shorea robusta.
Sinapis alba.
*Sulphur.*
Symplocos racemosa.
Taraktogenos kurzii.
Terminalia arjuna & chebula.
Trichosanthes dioica.
Vateria indica.
Withania somnifera.
Zanthoxylum budrunga.

**ANTIPERIODICS & FEBRIFUGES:—See also Antiseptics).**

Aconitum heterophillum.
Acorus calamus.
Adansonia digitata.
Alstonia constricta scholaris & A.
Andrographis paniculata.
Aristolochia indica, & A. bracteata.
Azasiracta indica.
Berberis aristata; B. asiatica; B. lycium.
Cæsalpinia bonducella, & C. coriaria.
Cedrela toona.
Clerodendron inerme & C. infortunatum.
Cocculus Cordifolia.
Coptis teeta.
Corydalis govaniana.
Coscinum fenestratum.
Dæmia extensa.
Eucaliptus globulus.
Eurycoma longifolia.
Fagræ fragrans.
Ficus oppositifolia.
Geniosporum prostratum.
Hedysarum gangeticum.
Helleborus niger.
Hemidesmus indica.
Holarrhena antidysenterica.
*Hydrargyri sulphidum rubrum.*
Hymenodictyon excelsum.
Justicia gendarussa.
Melia azadirachta.
Michelia champaca.
Nauclea ovalifolia.
Ocimum sanctum.
Oldenlandia herbacea.
Papaver somniferum.
Picrorhiza kurrœa.
Piper nigrum.
Plumbago zeylanica.
Pterocarpus santalinus.
Putranjiva roxburghii.
'Quinine'.
Roylea elegans.
Salix tetrasperma.
Soymida febrifuga.
Strychnos nux-vomica, & S. colubrina.
*Sulphur.*
Swertia Chirata.
Thevetia neriifolia.
Tinospora cordifolia.
Toddalia aculiata.
Trichosanthes cucumerina, & dioica.
Vernonia cinerea.
Viola odorata.
Vitex negundo.

**ANTIPHLOGISTICS:—**

Aloe litoralis.
Berberis aristata.
Datura fastuosa.
Hibiscus populnea.
Nerium Odorum.

Santalum album.
Tabernæmontana coronaria.

**ANTIPYRETICS: See also:— (Anti-periodics, Antiseptics):—**

Aconitum ferox, A. heterophyllum, A. napellus.
Alhagi maurorum.
Alstonia scholaris.
Andrographis paniculata.
Azasirachta indica.
Berberis aristata.
Cinchona succirubra & C. officinalis (see cortex).
Cissampelos pareira.
Cocculus cordifolia.
Coriandrum sativum.
Coscinum fenestratum.
Dæmia extensa.
'Dashamula roots'.
Desmodium gangeticum.
Emblica officinalis.
Grewia asiatica.
Hemidesmus indicus.
Hydrargyri Sulphidum Rubrum.
Melia azedarach.
Melia azadirachta.
Nyctanthes arbortristis.
Ocimum sanctum.
Oldenlandia herbacea.
Picrorrhiza kurroa.
Piper nigrum.
Prunus padus.
Pterocarpus santalinus.
'Quinine'.
Rubia cordifolia.
Salvadora persica.
Santalum album.
Swertia chirata.
Terminalia chebula & belerica.
Tinospora cordifolia.
Trichosanthes dioica.
Vermonia cinerea.
Viola odorata.
Vitex negundo.

**ANTIRHEUMATICS & ANTISPASMODICS:—**

Acorus calamus.
Andrographis paniculata.
Andropogon muricatum.
Argyrea speciosa.
Balsamodendron mukul.
Brassica nigra.
Cæsalpina bonducella.
Carthamus tinctorius.
Celastrus paniculata.
Datura fastuosa.
Dodonæa viscosa.
Elettaria cardamomum.
Glycerrhiza glabra.
Gymnema balsamicum.
Hedysarum gangeticum.
Hyoscyamus niger.
Linum usitatissimum.
Moringa pterygosperma.
Nardostachys jatamansi.
Oroxylum indicum.
Pæderia fœtida.
Phyllanthus emblica.
Picrorrhiza kurroa.
Ricinus communis.
Santalum album.
Semecarpus anacardium.
Sesamum indicum.
Sida cordifolia.
Solanum indicum & xanthocarpum.
Sphæranthus indicus.
Tabernæmontana coronaria.
Trichosanthes dioica.
Uraria lagopoides.
Vanda roxburghii.
Vitex negundo.
Vitis vinifera.

**ANTISCORBUTICS:—**

Aegle marmelos.
Carica papaya.
Citrus acida, & C. bergamia.
Feronia elephantum.

Lycopersicum esculentum.
Mangifera indica.
Moringa pterygosperma.
Musa sapientum.
Phyllanthus emblica.
Pyrusmalus.
Tamarindus indica.

**ANTISEPTICS: (See also "Disinfectants", Germicides, "Vermicides". See:—"Dyspepsia & Indigestion" in the Index of Diseases & their Remedies.**

Acacia catechu.
*Acidum sulphurosum*
Allium salivum*
Aloe literalis.
Alstonia scholaris.
Andropogon muricatus—+
*Antimony sulphide*
Asparagus racemosus.
Barleria prionitis.
Berberis aristata—+
Bombax malabaricum.
Cæsalpinia sappan.
Calophyllum inophyllum.
Carum copticum.
Caryophullus aromaticus.
Cassia fistula.
*Cera flava.*
Cinnamomum camphora.*
Cocculus cordifolia.
*Cupri sulphas.*
Curcuma longa, & C. zedoaria.
Emblica officinalis.
Ferula fœtida.*
Flacourtia ramontchi.
*Ghee.*
Glycerrhiza glabra.
Gymnema sylvestre.
Holarrhena antidysenterica.
Hygrophila spinosa.
Hyoscyamus niger.*
Ichnocarpus frutescens.
Ipomœa digitata.—+
*Mel depuratum.*
Melia azedarach.
Melia azadirachta.
Mimosa pudica.
Momordica charantia.
Nigella sativa.
Nymphæa stellata.
Oleum chaulmoogræ.
Oleum hydnocarpi.
Piper cubeba.—+
Pix liquida (tar stockholm.—Tar distilled from pine of various kinds).
Plumbago zeylanica.
Pongamia glabra.
*Potassii chloras.*
Pterocarpus santalinus.
Randia dumetorium.
*Rock salt.*
Rubia cordifolia.
Saccharum purificatum.
Santalum album.
Sodium borate (Borax).—+
Stercospermum suaveolens.
Swertia chirata.
Terminalia chebula & belerica.
Tribulus terrestris.—+
Trichosanthes dioica.
Woodfordia floribunda.

* Intestinal. + Urinary antiseptics.

**ANTISPASMODICS:**
**See "Antirheumatics".**

Abies webbiana.
Adhatoda vasica.
Allium sativum.
Alpinia officinarum.
Andropogon citratum.
Aplotaxis auriculata.
Artemisia indica.
Balsamodendron mukul.
Blumea balsamifera.
*Borax.*
Calotropis gigenta.
Camphora officinarum.
Cannabis indica; C. sativa.

Carum (Ptychotis) ajowan, & C. copticum.
Caryophyllus aromaticus.
*Castoreum.*
Chenopodium ambrosiodes.
Cinnamomum camphora, & C. zeylanicum.
Clerodendron siphonanthus.
Crocus sativus.
Datura alba. & D. fastuosa.
Dracontium polyphyllum.
Erythroxylum coca.
Euphorbia neriifolia.
Ferula asafoetida.
Gardenia gummifera, & G. lucida.
Gynandropsis pentaphylla.
Hyoscyamus insanus, & H. Niger.
Justicia adhatoda.
Lobelia nicotianæfolia.
*Moschus moschiferus.*
Nardostachys jatamansi.
Nicotiana tabacum.
Papaver somniferum.
Pinus webbiana.
*Potassii Nitras.*
Saussurea lappa.
*Sodii biboras.*
*Stannum.*
Styrax benzoin.
Valeriana hardwickii.
*Viverra zibetha.*
*Zinci oxidum*

## ANTISYPHILICS:—

Acacia catechu.
*Antimonium.*
*Arsenum.*
Balsamodendron mukul.
Calotropis gigantea.
Hemidesmus indicus.
Hydnocarpus wightiana.
*Hydrargyri sulphidum Rubrum*
*Hydrargyrum.*
Pinus deodara.
Piper nigrum.
Semecarpus anacardium.
Smilax china.
*Sulphur.*
Tinospora cordifolia.

## APERIENTS:—
See PURGATIVES

## APHRODISIACS:—

Aconthopodium hirtum.
Acorus calamus.
Allium sativum.
Alpinia galanga.
Amorphophallus campanulatus.
Anacardium occidentale.
Aplotaxis auriculata.
Areca catechu.
*Arsenic.* *
Asparagus adscendens, A. gonocladus, A. sarmentosus, & racemosus.
*Aurum.* *
Balsamodendron mukul.
Bambusa arundinacea (bamboo manna).
Bassia latifolia.
Batatas paniculate.
Belladonna (atropine). *
Bombax malabaricum.
Camphora officinarum.
Cannibus indica, & sativa. *
*Cantharides.* *
*Castoreum.*
Celestrus paniculatus.
'Cinchona'. *
Cinnamomum camphora.
Conium maculatum. *
Crocus sativus.
Curculigo ensifolia & orchioides.
Cynodon dactylon.
Dolychos pruriens.
Echinops echinatus.
'Ergot'. *
Erythroxylum coca.*
Eulophia campestris & vera.

Ferula asafœtida.
*Ferrum.*
Gaultheria procumbens. *
*Ghee.*
Glycine labialis.
Glycyrrhiza glabra.
Gossipium indicum.
Gymnema balsamicum & lactiferum.
Hamamelis virginiana. *
Hemidesmus indicus.
Herpestis monniera.
Hygrophila spinosa.
Ipomœa digitata.
Juglans regia.
Lepidium sativum.
Leptademia spartum.
*Mel depuratum.*
Mimusops hexandra.
*Moschus moschiferus.*
Mucuna pruriens, M. prurita.
Mutella occidentalis.
Myristica fragrans, & officinalis.
Nardostachys jatamansi.
Nerum odoratum.
Orchis mascula; O. latifolia.
Papaver somniferum. *
Pedalium murex.
Petrosalium sativum. (active principle, 'Apiol') *
Phaseolus radiatus & roxburghii.
*Phosphorus.* *
Piper betle.
Pistacia khinjuk.
Pyrethrum indicum radix.
Rhus succedania.
Saussurea lappa.
Semecarpus anacardium.
Shorea robusta.
Sida cordifolia.
Sinapis juncea.
Smilax chinensis.
Solanum indicum.
*Stannum* (bhasma)
Strychnia. * (Strychnos nux-vomica).
Tamarix articulata, & orientalis.
Terminalia chebula.
Tinospora cordifolia.
Tribulus terrestris.
Tricholepsis glaberrima.
Trigonella fœnum-græcum.
*Vanga bhasma.*
Vitis vinifera.
Withania somnifera.
* Internal.

**APPETISERS:—**
**See:—Carminatives.**

Abies webbiana.
Coriandrum sativum.
Elettaria cardamomum.
Nigella sativa.
Plumbago zeylanica.
Punica granatum.

**Aromatics:—(See also "Fragrants".)**

Abies webbiana.
Acorus calamus.
Carum copticum.
Caryophyllus aromaticus.
Cinnamomum camphora.
Coriandrum sativum.
Cuminum cyminum.
Curcuma longa; & C. zedoaria.
Cyperus rotundus.
Elettaria cardamomum.
Mesua ferrea.
Myristica fragrans.
Nardostachys jatamansi.
Piper cubeba.

**ASTRINGENTS:—See also:— "Astringent tonics" under 'Tonics'.**

Acacia arabica, & A. catechu.
*Acidum tannicum* (tannic acid)
Aconitum heterophyllum.

Acorus calamus.
Aegle marmelos.
Ailanthus malabarica.
Alstonia scholaris.
*Alumen.*
Aplotaxis duriculata.
Areca catechu.
Bassia latifolia.
Bauhinia variegata.
Blumea balsamifera & densiflora.
Bombax malabaricum.
*Borax.*
Butea frondosa.
Cæsalpinia coriaria & C. sappan.
Careya arborea.
Cassia auriculata.
Casuarina muricata.
Cinnamomum Cassia, C. zeylanicum.
*Coccus lacca.*
*Copper sulphate.*
Cordia angustifolia.
Cynodon dactylon.
Cyperus rotundus.
Diospyros embryopteris.
Elephantopus scaber.
Emblica officinalis.
Eucalyptus resinifera.
Eugenia jambolana.
Feronia elephantum.
*Ferri sulphuretum.*
Ficus Bengalensis, & glomerata, & religiosa.
Garcinia mangostana.
Gossypium indicum.
Grislea tomentosa.
Hamamelis virginiana.
Helicteres isora, & H. pubescens.
Heliotropium indicum.
Holarrhena antidysenterica.
Ipomœa digitata.
Ixora coccinea.
Jasminum grandiflorum.
Juglans regia.
Krameria triandra.
Lawsonia alba.
Lycopodium imbricatum.
Mangifera indica.
*Mel depuratum.*
Memecylon edule.
Menispermum glabrum.
Mesua ferrea.
Mimosa pudica.
Mimusops elengi.
Morinda citrifolia.
Myrica nagi, & M. sapinda.
Myristica fragrans.
Nelumbium speciosum.
Odina wodier.
Panicum italicum.
Papaver somniferum.
Phyllanthus emblica.
Pistacia Khinjuk.
*Plumbum salts.*
Psidium guyava, & pomiferum.
Pterocarpus santalinus.
Punica granatum.
Pyrethrum radix.
Quercus infectoria.
Rhus coriaria, & R. Succedanea.
Rottlera tinctoria.
Rumex crispus.
Santalum album.
Saraca indica.
Sesbania grandiflora.
Shorea robusta.
Spondias mangifera.
Strychnos potatorum.
*Sulphuret of antimony.*
Symplocos racemosa.
Syzigium jambolanum.
Tamarindus indica.
Tamarix gallica, & T. orientalis.
Terminalia arjuna; belerica, & chebulax tomentosa.
Uncaria gambier.
Urtica dioica.
Viburnum foetidum.
Woodfordia floribunda.
Wrightia antidysenterica.
*Zincum salts.*

**BITTERS & BITTER TONICS: (See Stomachics, and "Carminatives").**

Aconitum heterophyllum.
Ailanthus excelsa.
Alstonia scholaris.
Andrographis puniculata.
Aristolochia indica, & A. reticulata.
Berberis aristata.
Bœrhavia diffusa.
Cæsalpinia bonduc.
Calamus rotung.
Cardiospermum halicabum.
Citrus aurantium, var sinensis, & C. limonia.
Cocculus cordifolius.
Corchorus capsularis, & C. trilocularis.
Gentiana kurroa, & G. lutea.
Holarrhena antidysenterica.
Jateorhiza calumba, & J. palmata.
Luffa amara.
Melia azardirachta.
Momordica charantia.
Ophiorrhiza mungos.
Picræna excelsa.
Picrorrhiza kurroa.
Quassis excelsa.
Sphæranthus hirtus & indicus.
Swertia chirata.
Tinospora cordifolia.
Vanda Roxburghii.

**BLOOD PURIFIERS:—**

Abies webbiana.
Acacia catechu.
Adhatoda vasica.
Andrographis paniculata.
Bambusa arundinacea.
Berberis aristata.
Calotropis gigantea.
Cinnomomum camphora.
*Coccus lacca.*
Curcuma longa.
*Ferri sulphas.*
Hemidesmus indicus.
Hydnocarpus wightiana.
Melia azadirachta.
Piper nigrum.
Psoralea corylifolia.
Pterocarpus santalinum.
Rubia cordifolia.
*Sulphur*
Tinospora cordifolia.
Trichosanthes dioica.
Vitis vinifera.
Withania somnifera.

**BRONCHIAL ANTISPASMODICS: — See "EXPECTORANTS".**

**CARDIAC TONICS:— See "TONICS".**

**CARMINATIVES: (including flavouring agents, which are in italics). See: — "Stomachics"; "appetisers" & (aromatic stimulants").**

Abies webbiana.
Acorus calamus.
Alpinia nutans & species.
Amomum aromaticum, A. xanthiodes.
Andropogon citratum, nardus, martini, & muricatus.
Anethum graveolens, & A. sowa.
Anisomeles malabarica.
Anthemis nobilis.
Acquilaria agallocha.
Artemisia indica.
Balsamodendron mukul.
Blumea balsamifera.
Boswellia serrata.
Calophyllum inophyllum.
Capsicum frutescens, C. minimum.

Carum (Ptychotis) ajowan; C. (Ptychotis) roxburghianum; *Carum Carvi* & C. opticum.
Caryophullus aromaticus.
Cassia species.
Cedrus deodara.
Chavica betle; C. officinarum; C. roxburghii.
Chrysanthemum roxburghii.
Cinnamomum cassia, eucalyptoides, C. Iners, malabaricum, tamala, & zeylanicum.
Citrus limon.
Coleus aromaticus.
Coriandum sativum.
Cratæva religiosa.
Crocus sativus.
Cuminum cyminum.
Curcuma amada, aromatica, longa & zedoaria.
Cyperus pertinuis.
Elettaria cardamomum.
Embelia ribes.
Emblica officinalis.
Eugenia caryophyllata.
Eupatorium ayapana.
Feronia elephantum.
Ferula asafoetida.
Foeniculum, capillaceum, F. panmorium, & F. vulgare.
Grewia asiatica.
Hedychium spicatum.
Hyssopus officinalis.
Illicium verum.
Kaempfera galanga & K. rotunda.
Lavendula officinalis.
Liquidambar orientalis.
Melaleuca leucadendron.
Mel depuratum.
Melia azadirachta.
Mentha piperita.
Mesua ferrea.
Micromeria capitellata.
Mimusops indica.
Moringa pterygosperma.
Murayya (Bergera) Konigii.
Myrica sapida.
Myristica fragrans, M. malabarica, & M. officinalis.
Myrtus caryophyllus.
Nardostachys jetamansi.
Nigella indica, & sativa.
Origanum marjorana.
Peucedanum graveolens.
*Pimpinella anisum.*
Pinus deodara, & P. longifolia.
Piper cubeba, & P. nigrum; P. longum; P. betle, & aurantiacum.
Plumbago zeylanica.
Ptychotis ajowan.
Punica granatum.
Rock salt.
Rumex vesicarius.
Saussurea lappa.
Semecarpus anacardium.
Shorea robusta.
Sida cordifolia.
Solanum jacquini.
Strychnos potatorum.
Tamarindus indica.
Tectona grandis.
Terminalia chebula, & belerica.
Trigonella fœnum-græcum.
Vernonia anthelmintica.
Withania (Punceria) coagulans, W. (Physalis) somnifera.
Zanthoxylum alatum & species.
Zingiber cassumunar, officinale, & Z. zerumbet.

**CATHARTICS:—**

**See:—Purgatives,**

**CAUSTICS:—**

**See "Escharotics".**

(Ashes of the following plants are used as caustics for opening abscesses):—
Abrus precatorius.

Achyranthes aspera.
Allium sativum.
Alstonia scholaris.
Butea frondosa.
Cæsalpinia bonduc.
Calotropis gigantea.
Cassia fistula.
Cedrus deodara.
*Cupri sulphas.*
Echites dichotoma.
Erythrina indica.
Euphorbia nerifolia.
Gmelina arborea.
Holarrhena antidysenterica.
Justicia adhatoda.
Luffa pentandra.
Musa sapienta.
Nerium odorum.
Plumbago zeylanica.
Pongamia glabra.
Semecarpus anacardium.
Shorea robusta.
Stercospermum suaveolens.
Symplocos racemosa.
Terminalia species.

## CHOLAGOGUES:—

*Ammonium chloride.*
Bombax malabaricum.
Calotropis gigenta.
Carthamus tinctorius.
Cascaria esculenta.
Cassia lanceolata.
Cichorium intybus.
Cocculus cordifolius.
Cosmostigma racemosa.
Eclipta alba.
*Fel bovinum purificatum.*
Glycerrhiza glabra.
Ipomœa digitata or paniculata.
Lawsonia alba.
Moringa pterygosperma.
Nymphæa stellata.
Pinus longifolia.
Podophyllum emodi; P. peltatum; P. indicum.
Sesamum indicum.
*Sodium chloride.*
Trichosanthes cucumerina.

## COAGULANTS:—

Blood-platelets.
Calcium salts.
Heavy metals.
Viper venom.
Vitamin K.

## CONVULSANTS:—

Strychnos nux-vomica.

## COOLING:

**(See also Refrigerants).**

Andropogon muricatus.
Aplotaxis auriculata.
Bambusa arundinacea (Bamboo manna).
*Borax.*
Cinnamomum camphora.
Cuminum cyminum.
Curcuma zedoaria.
Elettaria cardamomum.
Emblic myrobalam.
*Ghee.*
Hygrophila spinosa.
Ipomoea digitata.
Mesua ferrea.
Mollugo cerviana.
Piper cubeba.
*Potassii carbonas.*
Punica granatum.
Rock-salt.
Santalum album.
Vitis vinifera.
Zingiber officinale (raw).

## COOLING DRINKS & SHERBUTS.

Aegle marmelos.
Andropogan muricatum.
Citrus acida, & Citrus aurantium.

Hordeum vulgare.
Oxalis corniculata.
Phyllanthus emblica.
Punica granatum.
Tamarindus indica.

**COUNTER IRRITANTS:—**

**See also:—Rubifacients.**

Abrus precatorius.
Ammannia baccifera; A. vesicatoria.
Argemone mexicana.
Berberis aristata.
Brassica alba.
Calotropis gigentea; C. procera.
Capsicum species.
Cassia alata, & C. fistula, C. foetida, C. tora, C. occidentalis.
Celastrus paniculata.
Cleome viscosa.
Cuminum cyminum.
Cyperus rotundus.
Dalbergia odorata.
Gynandropsis pentaphylla.
Gynocardia odorata.
Holarrhena antidysenterica.
Lectuca scariola.
Melia azedarach.
Moringa pterygosperma.
*Mylabris cichorii.*
Piper longam & nigrum.
Plumbago zeylanica & rosea.
Pongamia glabra.
Psoralia corylifolia.
Salvadora persica.
Semecarpus anacardium.
Sinapis alba.
Zingiber officinale.

**DEMULCENTS:—**

**(See also "Emollients").**

Abelmoschus esculentus.
Abrus precatorius.
Acacia arabica, farnisiana, senegal & speciosa.
Althaea officinalis.
Amarantus spinosus.
Amomum subulatum.
Acquilaria agallocha.
Arachis hypogaea (oil).
Asparagus adscendens.
Astragalus gummifer.
Bombax malabaricum.
Borassus flabellifer.
Canarium commune.
Clitorea ternatea.
Cocculus villosus.
Cocos butyraceae, C. nucifera.
Cordia domestica; latifolia, & C. myxa.
Curculigo orchisides.
Curcuma zedoaria.
Cydonia vulgaris.
Cyperus rotundus.
Dipterocarpus turbinatus.
*Ghee.*
*Glycerinum.*
Glycyrrhiza glabra.
Gmelina parvifolia.
Gossypium indicum (oil).
Gracilaria lichenoides.
Gynocardia odorata.
Hedysarum alhagi.
Hemidesmus indicus.
Hibiscus rosa sinensis & H. esculentus.
Hygrophila spinosa.
Ipomoea digitata.
Lepidium sativum.
Linum usitatissimum (oil).
Lycopodium clavatum.
*Mel Depuratum.*
Mimosa species.
Nelumbium speciosum.
Nymphaea lotus & stellata.
Ocimum gratissimum, pillosum & basilicum.
Onosma bracteatum.
Oryza sativa (starch, husked seed, ground and sifted seed)
Panicum frumentaceum.

Permelia perlata.
Pedalium murex.
Pistacia integerrima.
Plantago ispaghula, & P. ovata species.
Poa cynosuriodes.
Prunus amygdalus (oil); & P. communis.
Punica granatum.
Pyrus cydonia.
Rhus succedanea.
Saccharum species.
Salvia aegyptiaca.
Sesamum indicum. (oil & leaves).
Sida species.
Solanum tuberosum (starch).
Symplocos racemosa.
Terminalia catappa.
Tiaridium indicum.
Tribulus terrestris.
Trichodesma zeylanica.
Triticum aestivum & T. sativum (starch).
Typha angustifolia.
Vitis vinifera.
Zea mays (starch).

**DEODORISERS:—**

Balsamodendron mukul.
Cinnamomum camphora.
Curcuma zedoaria.
*Moschus moschiferus.*
Santalum album.

**DEPRESSANTS (CARDIAC):—**

Aconitum napellus.

**DESICCANTS:—**

Bole armeniac.
*Kaolinum.*
Lycopodium clavatum.
*Plumbi carbonas.*
Quercus infectoria.
Zinci oxidum.

**DIAPHORETICS & REFRIGERANTS:—**

Andropogan citratum; A. muricatus.
Berberis asiatica.
Cyperus rotundus.
Leucas linifolia.
Murraya koinigii.
Nelumbium speciosum.
Ocimum sanctum.
Pavonia odorata.
Pinus cedrus & P. deodara, or Cedrus deodara.
Prunus pudam.
Pterocarpus santilinus.
Zingiber officinale.

**DIAPHORETICS & SUDORIFICS:—(See also: — Refrigerants).**

Aconitum ferox.
Acorus calamus.
Andropogon citratum, A. muricatus, & species.
Anisochilus carnosum.
Anisomeles malabarica & A. ovata.
Artemesia absinthium.
Berberis asiatica.
Blumea balsamifera.
Boerrhavia diffusa & B. procumbens.
Calotropis gigantea, & C. procera.
Camphora officinarum.
Capsicum frutescens.
Carthamus tinctorius.
Celastrus paniculata.
Cinnamomum camphora.
Colchicum luteum (sudorific).
Coriandrum sativum.
Crinum asiaticum, C. toxicarium.
Cyperus pertenius & C. rotundus.

Elephantopus scaber (sudorific).
Eupatorium ayapana.
Hemidesmus indicus.
Hordium vulgare.
Justicia gendarussa.
Lactuca scariola.
Meriandra strobilifera.
Mesua ferrea.
Mimosa suma.
Moringa pterygosperma.
Naregamia alata.
Ocimum balsilicum & O. sanctum.
Papaver somniferum.
Pinus deodara.
Plumbago Zeylanica.
*Potassium Nitrus.*
Quassia excelsa.
Ricinis communis.
Scindapsus (Pothas) officinalis
Sesamum indicum.
*Sulphur.*
Symplocos racemosa.
Tylophora asthmatica.
Zingiber officinale.
Zizyphus jujuba.

**DIGESTIVES:—**

Caryophullus aromaticus.
Carum copticum.
Emblic myrobalan.
Eclipta erecta.
Coriandrum sativum.
Curcuma longa.
Cuminum cyminum.
Ferula foetida.
Mesua ferrea.
*Moschus moschiferus.*
Myristica fragrans.
Piper longum & its roots, P. betle, P. cubeba, Piper nigrum.
Plumbago zeylanica.
Potassii carbonas.
*Rock Salt.*
Terminalia chebula.
Zingiber officinale.

**DISINFECTANTS:—See also "Antiseptics", & "Deodorisers", "Germicides" & "Vermicides".**

Achyranthes aspera.
Balanites roxburghii.
Calotropis gigantia.
Caesalpinia bonduc.
Cissempelos hernandifolia.
Cocculus cordifolia.
Gloriosa superba.
Heliotropium indicum.
Melia azadirachta.
Picrorrhiza kurroa.
Pongamia glabra.
Pterocarpus santalinus.
Senseviera zeylanica.
Santalum album.
Sodium chloride impura.
Tragia involucrata.
Trichosanthes dioica.
Vanda roxburghii.

**DIURETICS:—**

Abutilon indicum.
Achyranthes aspera.
Acorus calamus.
Agati grandiflora.
Allium sativum.
*Ammonii carbonas.*
Andropogon muricatus.
Apocynum cannabinum.
Asparagus racemosus.
*Asphaltum.*
Azima tetracantha.
Barleria longifolia.
Berosma betulina.
Berberis aristata.
Beta marituma.
Boerhavia diffusa; B. erecta & B. repens.
*Borax.*
Butea frondosa.
Camellia sinensis.

Celastrus paniculatus.
Cinnamomum camphora; C. zeylanicum.
Cissampelos pareira & hernandifolia.
See:—Pareira brava.
Citrullus vulgaris.
Clitoria turnatia.
Cocculus cordifolius.
Costus speciosus.
Cratoeva religiosa.
Crinum asiaticum.
Cubeba officinale.
Cucumis sativus.
Cynodon dactylon.
Cyperus rotundus.
Cytisus scoparius.
Digitalis purpurea etc.
Dipterocarpus laevis.
Elettaria cardamomum.
Erigeron canadense.
Euphorbia nivulia.
Glycerrhiza glabra.
Hedysarum alhagi.
Hemidesmus indicus.
Herpestis monniera.
Hibiscus esculantus.
Hordeum distichon.
Hygrophila longifolia; H. spinosa.
Hydrocotyle asiatica.
Ipomoea reniformis.
Juniperus macropoda.
Ledebouria hyacinthoides.
Luffa amara.
Lycopodium clavatum.
Michelia champaka.
Mimusops elengi.
Mollugo cerviana.
Moringa pterygosperma.
Myristica fragrans.
Nardostachys jatamansi.
Ocimum O. anisatum, basilicum, O. citratum, & O. sanctum.
Panicum frumentaceum.
Pareira brava (see:—Cissampelos pareira).
Parmelia perlata & P. perforata.
Pedalium murex.
Phyllanthus niruri; & P. urinaria.
Physalis alkekinji; P. somnifera.
Pinus deodara.
Piper cubeba.
Pistacia lentiscus.
Plantago ispagula & P. ovata.
Plectranthus sculellaroides.
Poa cynosurioides.
Portulaca oleracea & P. quadrifida.
Potassii carbonas & P. nitras.
Pothos officinalis.
Premna spinosa.
Raphanus sativus.
Saccharum officinarum; S. spontaneum & S. sara.
Santalum album.
Saxifraga ligulata.
Scilla indica.
Sesbania grandiflora.
*Sodium salts.*
Solanum, S. jacquini, S. nigrum & S. xanthocarpum.
Strychnos potatorum.
Taraxacum officinale.
Trianthema portulacastrum.
Tribulus lanuginosus; T. terrestris.
Urginea indica.
Viola odorata.
Vitus vinifera.
Withania (Physalis) somnifera
Xanthium indicum & X. strumarium.
Zingiber officinale.

**ECBOLICS:—See "Abortifacients"; "Emmenagogues"; Oxytocics; Parturifacients; & "Uterine contractors".)**

Aristolochia indica.

Carum roxburghianum.
Claviceps purpurea of Secale cereale.
Ferula asafoetida.
Gossypium herbaceum.
Piper longum.
Saraca indica.
Tylophora asthmatica.

**EMETICS:—**

Abrus precatorius.
Acalypha indica.
Achyranthes aspera.
Acorus calamus.
Alangium decapetalum.
*Alumen* (repeated doses).
Andropogon serratus.
Anethum sowa.
Anthemis nobilis.
Barleria cerulea.
Barringtonia acutangula.
Bassia latifolia & B. longifolia.
Bombax malabaricum.
Brassica juncea.
Calamus rotang.
Calotropis gigantea, & C. procera.
Cassia tora.
Cephalandra indica.
Citrullus colocynthis.
Clitoria ternatea.
*Copper sulphate.*
Crinum asiaticum; C. deflexum, var, toxicarium.
Crotalaria juncea.
Cucumis pseudo-colocynthis.
Cucumis trigonus.
Echites antidysenterica.
Entada scadens.
Euphatorium ayapana.
Ficus oppositifolia, & F. polycarpa.
Galedupa arborea.
Hedysarum alhagi.
Holarrhena antidysenterica.
Lagenaria vulgaris.
Ledebouria hyacinthoides.
Luffa species.
Mallotus phillippinensis.
*Mel.*
Melia azedarach.
Momordica charantia & M. monadelpha.
Naregamia alata.
Nicotina tabacum.
Pentapetes phœnicea.
Physalis flexuosa.
Piper longum.
Plumbago zeylanica.
Podophullum emodi.
Punceria coagulans—see:— Withania coagulans.
Randia dumetorum.
*Rock salt.*
Scilla indica.
Secamone emetica.
Sinapis alba, & S. juncea.
Sinapis dichotoma.
*Sodium chloride.*
Strychnos potatorum.
Tylophora asthmatica.
Urginea indica.
Vangueria spinosa.
Withania (Punceria) coagulans.

**EMMENAGOGUES:—See also (Abortifacients)**

Abroma augusta.
Acalypha indica.
Allium sativum.
Aloes indica, & A. litoralis.
*Ammonium chloride*
Andropogan muricatus.
Anthemis nobilis.
Balsamodendron mukul & B. myrrh.
Bambusa arundinaceæ.
Blumed balsamifera; & B. lacera.
Brassica nigra.
Calotropis gigantea.
Carica papaya.

Cichorium intybus; & C. indiva.
Cinnamomum cassia.
Cow's urine.
Curdled milk.
Cubeba officinalis.
Daucus carota.
Erythroxylon coca.
*Ferrum.*
Ferula asafœtida.
Gossypium herbaceum.
Gossypium indicum.
Khito (a kind of Pea).
Lycopodium clavatum.
Michelia champaca.
Moringa pterygosperma.
Nardostachys jatamansi.
Nerium odorum.
Nigella sativa.
Peganum harmala.
Plumbago rosea.
Rubia cordifolia.
Ruta angustifolia, & R. graveolens.
Saraca indica.
Sesamum indicum.
Strychnos nux-vomica.
Trigonella foenum-graecum.
Thevatia nerifolia.
Vinegar.

**EMOLLIENTS:—(See also "Demulcents")**

Acacia catechu, fernasiana & senegal.
*Acidum oleicum (oleic acid).*
Acipenser huso.
*Adeps.*
Arachis hypogœa (oleum arachis).
Buchanania latifolia.
*Cera alba, & Cera flava.*
*Cetaceum.*
Cocos nucifera (oleum cocos).
Diosypros glutinosa.
Ficus carica.
*Ghee.*
Gossypium indicum, etc. (oleum gossypii seminis).
Hibiscus rosa sinensis.
Linum usitatissimum (oleum lini).
*Mel.*
Olea Europœa (oleum olivæ).
Prunus amara; amygdalus; P. communis; P. dulcis, (oleum amygdalæ).
Sesamum indicum (oleum sesami).
*Sevum prœparatum.*
Shorea robusta.
Terminalia arjuna, & tomentosa.
Theobroma cacoa (oleum theobromalis).
Zizyphus jujuba.

**ERRHINES:—See:— Stenutatories.**

Acacia sirisha.
Achyranthes aspera, & fruticosa.
Aconitum heterophyllum.
Acorus calamus.
Allium sativum.
Balanitis Roxburghii.
Bassia latifolia.
Betula bhoorja.
Borassus flabelliformis.
Calotropis giganta & procera.
Cardiospermum halicacabum.
Citrus medica.
Clitoria ternatea.
Embelia ribes.
Ferula asafoetida.
Flacourtia cataphracta.
Galedupa arborea.
Garcinia xanthochymus.
Gymnema sylvestre.
Halicacabum cardiospermum.
Hedysarum alhaji.
Jasminum grandiflorum.

Momordica monadelpha.
Moringa guilandiana; M. hyperanthera; & M. pterygosperma.
Nerium odorum.
Nicotina tabacum.
Ocimum & album sanctum.
Phyllanthus emblica.
Piper longum & nigrum.
Pongamia glabra.
Pyrethrum indicum.
Saccharum sara.
Salvadora oleoides, & persica.
Shorea robusta.
Sinapis alba.
*Sodium chloride.*
Tachardia lacca (shellac).
Xanthochymus pictorius.
Zingiber officinale.

**ESCHAROTICS:—See "Caustics".**

**EVACUANTS:—See "Purgatives", etc.**

**EXPECTORANTS:—**

**(See also:—bronchial antispasmodics).**

Abies webbiana.
Acalypha indica.
Achyranthes aspera.
Adhatoda vasika.
Allium sativum.
Alpinia officinarum.
*Ammonium chloride.*
Anisochilus carnosus.
Aplotaxis auriculata.
Aristolochia indica.
Balsamodendron mukul, B. myrrh; opobalsamum; & B. pubescens.
Bambusa arundinacea.
Barringtonia acutangula.
*Benzoinum.*
Blumea balsamifera.
Boerhaavia diffusa.
Cactus indicus.
Calotropis gigantea, & procera.
Camphora officinarum.
Caryophyllus aromaticus.
Cephalis acuminata, & C. ipecacuanha.
Cinnamomum camphora, & C. Zeylanicum.
Clerodendron serratum.
Cocculus cordifolius.
*Corallium rubrum (calcined).*
Coriandrum sativum.
Crinum asiaticum.
Cubeba officinalis.
*Cupri sulphas.*
Curcuma zedoaria.
Dæmia extensa.
Dipterocarpus turbinatus.
Dorema aureum.
Elettaria cardamomum.
Erythroxylon coca.
Eucalyptus globulus.
Euphatorium ayapana.
Euphorbia hirta, E. perviflora; E. pilulifera.
Ferula asafœtida.
Glycyrrhiza glabra & glandulifera.
Grindelia camporum (bronchial anti-spasmodic).
Hydrocotile asiatica.
Ipomoea digitata.
Justicia adhatoda.
Lactuca scariola.
Ledebouriahyacinthoides.
Liquidambar altingia; L. orientalis.
Lobelia nicotianifolia (bronchial antispasmodic).
*Mel.*
*Moschus moschiferus.*
Myrica sapida.
*Mytilus margaritiferus* (calcined).
Naregamia alata.

Nelumbium speciosum.
Nicotina tabacum.
Nigella sativa.
Nymphælotus.
Ocimum basilicum & O. sanctum.
Opuntia dillenii.
Pimpinella anisum.
Pinus sylvestris, & P. webbiana.
Piper longum; cubeba & nigrum.
Pistacia integerrima, & lentiscus.
Polygala crotalarioides; P. senega; P. telephioides.
Prunus serotina (bronchial sedative).
Quillaja saponaria.
Rhus succedanea, & Kakrasingi.
Ruta graveolens.
Saccharum officinarum.
Saussurea lappa.
Scilla indica.
Scindapsus officinalis.
Sisymbrium irio.
Solanum indicum; jaquini & xanthocarpum.
Styrax benzoin.
Terminalia belerica.
Tylophora asthmatica.
Urginea indica, & maritima.
Viola odorata.
Zizyphus vulgaris.

**FEBRIFUGES: See:—**

**Antiperiodics; Antipyretics; Antiseptics**

**FRAGRANTS:—(See also:— "Aromatics".)**

Aplotaxis auriculata.
Caryophyllus aromaticus.
Cinnamomum camphora.
Coriandrum sativum.
Cumimum cyminum.
Curcuma zedoaria.

**GALACTAFUGES:—See also:—Lactifuges.**

Chavica betle.
Jasminum sambac.
Meriandra strobilifera.
Phaseolus mungo.

**GALACTAGOGUES:—See also:—Lactagogues.**

Abelmoschus esculantus.
Allium sativum.
Alœ litoralis.
Andropogon muricatum.
Asparagus racemosus.
Çocculus cardifolius.
Cyperus rotundus.
Gossypium herbaceum.
Hordeum vulgare.
Hygrophila spinosa.
Ipomoea digitata.
Jatropha curcas.
Nigella sativa.
Oryza sativa.
Piper longum.
Poa cynosuriodes.
Ricinus communis.
Saccharum officinarum; cylindricum; & spontaneum.

**GERMICIDES:—See also:— "Antiseptics; Disinfectants & Vermicides.**

**GLUCOSIDES:—**

*Aloin* (aloe vera).
*Amygdalin* (Linum usitatissimum; Amygdlæ dulcis; Prunus pudam).
*Colocynthin* (Citrullus colocynthus).
*Crocin* (Crocus sativus).

*Glycirrhizin* (Glycyrrhiza glabra).
*Indican* (Indigofera tinctoria).
*Loganin*, (Aconitum ferox).
*Neriene & Rosaginin* (Nerium odorum).
*Phloridzine* (Apples, Plums & cherries).
*Picrorrhizin* (Picrorrhiza curroa).
*Saponin* (Celastrus paniculata; Cratæva religiosa, Randia dumetorum).
*Sinalbin* (Piper album).
*Sinigin* (Piper nigrum; Brassica alba, & nigra).

**GUMS; GUM RESINS, Cont'g plants:—**

Acorus calamus.
Alœ vera.
Balsamodendron mukul.
Butea frondosa.
Calotropis gigantea.
Cinnamomum Zeylanicum.
Curcuma zedoaria.
Euphrobia antiquorum.
Feronia elephantum.
Ficus bengalensis; F. glomerata; F. infectoria; F. religiosa.
Gardenia gummifera.
Glycyrrhiza glabra.
Mesua ferrea.
Pinus longifolia.
Pongamia glabra.
Saussurea lappa.
Shorea robusta.

**HAEMATINICS:—(See "Anaemia" in the Index of Diseases and their Remedies).**

Aegle marmelos.
Asparagus racemosus.
Cæsalpinia bonduc.
Calotropis giganta.
Cephalandria indica.
*Coccus lacca.*
Cratæva religiosa.
Ferric salts.
Gymnema sylvestre.
Moringa pterygosperma.
Plumbago zeylanica.
Pongamia glabra.
Pothos officinalis.
Premna serratifolia.
Sanseviera zeylanica.
Sesbania aculeata.
Solanum indicum & xanthocarpum.
Terminalia arjuna; bellerica, & chebula.

**HAEMOSTATICS & STYPTICS:—**

**(N. B. Asterisk marked drugs are styptics.)**

Acacia catechu.
Aconitum heterophyllum.
Acorus calamus.
Aegle marmelos.
Andropogon muricatum.
Asclepias curassavica.
Balsamodendron myrrha.
Bassia latifolia.
Berberis aristata.
Bombax malabaricum.
Borassus flabelliformis.*
Cocos nucifera.*
Colocasia antiquorum.*
Crocus sativus.
Dalbergia ougeinensis.
Desmodium triflorum.
Diospyros glutinosa.
Eugenia jambos.
Eupatorium ayapana.
Ficus indica; F. glomerata; F. infectoria; & F. religiosa.
Glycyrrhiza glabra.
Gmelina arborea.
Holarrhena antidysenterica.

Hopea odorata.*
Jatrópha curcas.
Jonesia ashok.
Mangifera indica.
*Mel.*
Mesua ferrea.
Nelumbium speciosum.
Nymphae stellata.
Pentaptera arjuna.
Plantago' ispagula.
Plumbago zeylanica.
Premna serratifolia.
Punica granatum.
Quercus infectoria.
*Sodium chloride.*
Solanum indicum & xanthocarpum.
Stereospermum suaveolens.
Symplocos racemosa.
Terminalia chebula.
Tribulus terrestris.
Uraria lagopoides.
Woodfordia floribunda.

**HELMINTHICS:—See:— Anthelmintics, etc.**

**HYPNOTICS:—(See also:— Sedatives, Anodynes; Narcotics; Soporifics; Somnifacients.)**

Cannabis indica.
Hyoscyamus niger.
Lactuca scariola.
Myristica fragrans & officinalis.
Papaver somniferum.
*'Picrotoxin'* (glucoside, from seed of Anamirta paniculata).
Rauwolfia serpentina.
Strychnos nux-vomica.

**INSECTICIDES:—(See "Anthelmintics" "Parasiticides")**

Derris uliginosa.
Pistia (stratiotes).

**INSECTICIDES & INSECTIFUGES:—**

Acorus calamus.
Anamirta cocculus,—see Cocculus indicus.
Aplotaxis auriculata.
Azadiracta indica.
Chrysanthemum cinerariafolium, (Pyrethrum).
Citronella oil (from Andropogon genus etc.)
Sassafras officinale; S. variifolium.
Vernonia anthelmintica.

**IRRITANTS:—(See also Counter-Irritants; Rubefacients).**

Abrus precatorius.
Aconitum ferox.
Allium sativum.
Ammonium & its preparations.
Oleum amygdalæ volatile purificatum.
Oleum anisi.
Asclepias curassiania.
Baliospermum montana.
Balsamum peruvianum (from Myroxylon pereiræ).
Balsamum tolutanum (from Myroxylon toluiferum).
*Bee-Venom.*
Brassica alba.
Buchu folia (of Barosma betulina).
Oleum Cadinum (oil of cade; juniper tar-oil).
Oleum cajuputi (cajuput oil from Melaleuca leucodendron).
Calotropis gigantea.
Camphor oleum (Camphora officinarum).
Cantharidinum (from Cantharis mylabris).

Capsicum (from Capsimum minimum).
Oleum cari (from caraway).
Cineol—see:—Eucalyptol herebelow.
Cinnamomum zeylanicum.
Citrallus colocynthus.
Colophonium (colophony resin).
Copaiba (from species of copaifera).
Coryophyllum (from Eugenia aromatica).
Crinum asiaticum.
Croton tiglium.
Eletteria cardamomum.
Eucalyptol or Cineol (from Eucalyptus oil).
Euphorbia antiquorum & E. neriifolia.
Ferula foetida.
Foeniculam vulgare.
Gloriosa superba.
Jatropha curcus.
Oleum juniperi (from Juniperus communis).
Oleum lavandulae (from Lavandula officinalis).
Lagenaria vulgaris.
Limonix cortex (from Citrus limonia).
Luffa amara; L. echinata.
Oleum menthae piperitae (from Mentha piperata).
Menthol (peppermint camphor).
Myristica fragrans.
Myrrh (from Commiphora molmal).
Nerium odorum.
Randia dumetorum.
Oleum Rosmarini (from Rosmarinus officinalis).
Oleum Santali (from Santalum album).
Strychnos nux-vomica.
Styrax (from Liquidambar orientaleis).
Oleum Terebinthinae (oil of turpentine).
Thymol (from Thymus vulgaris).
Valeriana officinalis.
Zingiber officinale.

**LACTAGOGUES:—See:— "Galactagogues" —**

**LACTIFUGES:—See:— "Galactafuges".**

**LAXATIVES:—See:— "Purgatives"; "Salines".**

**LITHONTRIPTICS:—**

*Asphaltum.*
Barleria prionitis.
Butea frondosa.
Calotropis giganta.
Capparis trifoliata.
Coleus aromaticum.
*Copper sulphate.*
Crataeva religiosa.
Emblica officinalis.
Euphorbia nerifolia.
*Ferri sulphuretum.*
Ferula asafoetida.
Herpestis monniera.
Nymphaea stellata.
Pentaptera arjuna.
Plectranthus scutellaroides.
Poa cynosuriodes.
Saccharum spontaneum.
Saxifraga ligulata.
Scindapsus officinalis.
*Sodium chloride, impura.*
Terminalia arjuna, chebula & balerica.
Tribulus terrestris.
Vanda Roxburghii.

**LUBRICANTS:—**

*Cera flava.*
Oleum ricini.

Oleum sesami.

**MYDRIATICS:—**

Datura alba (daturine).
Scopolia lurida.
Solanum nigrum (solanine).

**MYOTICS:—Papaver Somniferum.**

**NARCOTICS:—See also:— Sedatives, Soporifics; Anodynes; Somnifacients; Hypnotics.**

Aconitum ferox.
Aplotaxis auriculata.
Artemesia absinthium.
Cannabis sativa, & C. indica.
Celsia coromandeliana.
Cocculus indicus.
Datura alba, & D. fastuosa.
Hyoscyamus insanus.
Lactuca scariola.
Meconopsis aculeata, & M. nipalensis.
Melia azedarach.
Myristica malabarica.
Nicotiana tabacum.
Papaver somniferum.
Santalum album.
Withania (Physalis) somnifera.

**NAUSEANTS:—**

Ferula foetida, F. narthex, etc.
Valeriana officinalis, etc.

**NERVINES:—See:—Tonics.**

Aconitum ferox, & A. heterophyllum.
Canabis indica, C. orientalis & C. sativa.
Canscora decussata.
Centipeda orbicularis.
Delphinium denudatum.
Dhatura alba; D. fastuosa & D. nigra.
Gymnema sylvestre.
Herpestis monnifera.
Hyoscyamus aureus; H. niger; H. reticularis, etc.
Nicotiana tabacum.
Papaver somniferum.
Rauwolfia serpentina.
Sida cordifolia.
Solanum nigrum.
Strychnos ignatii, & S. nux-vomica.
Withania somnifera.

**NUTRIENTS:—See also:— Nutritives.**

Glucosum liquidum (liquid glucose).
Hordeum distichon. (Extract of malt).
Laevillosum (laevulose, frutose).
Saccharum purificatum (Sucrose).

**NUTRITIVES:—See "Tonics" & Nutrients; Analeptics.**

Asparagus racemosus.
Cocos nucifera.
Cybium commersonii.
*Ghee.*
Gracilaria lichenoides.
Ipomoea digitata.
*Mel depuratum.*
Oleum sessami.
Punica granatum.
Squalus carcharis.
Tinospora cardifolia.
Withania somnifera.

**OXYTOCICS:—See:— Ecbolics, etc.**

**PARASITICIDES:—See:— Antiparasitics.**

**PARTURIFACIENTS:—**
**See:—"Ecbolics" etc.**

Aristolochia bracteata.
Cannabis sativa.
Chavica roxburghii.
Hordeum decorticatum & Oryza sativa (Ergot from these two drugs).
Ophioxylon serpentinum.

**PECTORALS:—**

Achyranthes aspera.
Andropogon citratis; A. iwarancusa; A. martini and A. muricatus.
Asparagus racemosus.
Boerhavia diffusa.
Cassia fistula; C. lanceolata, and C. sophora.
Clitoria ternata.
Desmodium triflorum.
Embelia ribes.
Glycine labialis.
Hemidesmus indicus.
Hygrophila spinosa.
Ichnocarpus frutescens.
Ipomœa digitata.
Mucuna pruriens.
Myrica sapida.
Ocimum sanctum, & O. hirsutam.
Ricinis communis.
Ruta graveolens.
Sida cordifolia, & S. spinosa.
Solanum indicum, S. xanthocarpum & S. nigrum.
Strychnos nox-vomica.
Tragia involucrata.
Tribulus terrestris.
Uraria lagopoides.
Vitex negundo.
Vitis vinifera.

**PRESERVATIVES:—**

Ghee.
Honey.
Oil.
Rock salt.
Sugar.

**PURGATIVES & LAXATIVES:—(Cathartics, Salines, Evacuants & Aperients). (Laxatives are with asterisks).**

Abrus precatorius.
Acacia concinna.
Acalpha indica.
Achyranthes aspera.
Aegle marmelos.*
Agati grandiflora.
Aleurites triloba.
Alhaqi maurorum.
Aloes barbedensis & A. indica; (anthracene purgative). Alœ literalis; A. vera.
Anthericum tuberosum.
Argemone mexicana.
Asclepias geminata.
Baliospermum montanum.
Baringtonia acutangula.
Berthelotia lanceolata.
Bignonia Suaveolens.
Boerhavia diffusa;* B. procumbens.
Bombax malabaricum.
Butea frondosa.
Cæsalpinia bonduc.
Calotropis gigantea.
Canscora decussata.
Cardiospermum helicacabum.
Carthamus tinctorius.
Cascara sagrada.
Cassia absus (drastic purgative). C. acutifolia; C. alata; C. fistula; C. angustifolia, (anthracene purgative); C. lanceolota; C. occidentalis (drastic purgative); C. sophora & C. tora.
Cissampelos hexandra.
Citrullus or Citrus colocynthis (drastic purgative).

Cleome felina.
Clitoria ternatea.
Convolvulus turpethum.
Costus speciousus.
Croton oblongifolius; C. pavana; C. polyandrum & C. tiglium (drastic purgative).
Cucumis hardwickü & C. trigonus.
Cuscuta reflexa (cholagogue purgative).
Desmodium triflorum.
Eclipta alba, & E. erecta (cholagogue purgative).
Emblica officinalis.
Euonymus atropurpureus (cholagogue purgative).
Euphorbia nerifolia (drastic purgative).
*Fel bovis, or F. bocinum.*
Ficus carica.*
Fumaria officinalis & F. parviflora (cholagogue purgatives).
Garcinia indica; G. morella & G. pictoria; G. purpuria & G. xanthochymus.
Gardenia campanulata.
Geledium cartilagineum,* G. corneum lamouroux.
Glycyrrhiza glabra.
Gmelina arborea.
Grewia asiatica.
Halicacabum cardiospermum.
Helleborus niger (drastic purgative).
Hemidesmus indicus.
Hordeum hexactachon.
Indigofera tinctoria.
Ipomoea batatas; I. cærulea, I. cymosa, I. digitata, I. hederaceæ (drastic purgative).
I. pescapræ, I. purga, I. remiformis; & I. terpethum (drastic purgative).
Jatropha curcus; J. montana.
Lagenaria vulgaris (drastic purgative).
Luffa acutangula; L. aegyptica; L. amara, and L. echinata.
Lycopersicum esculentum.
*Magnesium sulphate.*
Mallotus philippinensis.
Mengifera indica.
Melia azedarach.
Mirabilis jalapa.
Momordica charantica.
Oleum ricini.*
Oleum sesami.*
Panicum frumentaceum.
Pavetta indica.
Pharbitis nil or semina.
Picrorrhiza kurrooa.*
Plantago ovata.*
Plumbago zeylanica.
*Phosphate of sodium.*
Plumeria acutifolia.
Poa cynosuroides.
Podophyllum emodi, P. indicum, P. peltatum (cholagogue purgative).
Premna serratifolia.
Prunus amygdalus,* P. communis,* P. domestica,* P. institia.*
Punica granatum.
Pyrus malus.*
*Rasakarpura;* Rock-salt.**
Rhanus purpureus, & purshianus (anthracene purgatives).
Rheum emodi (anthracene purgative.
Rheum palmatum.
Ricinus communis.
Rosa damascena, & R. glandulifera.
Saccharum spontaneum.
Salvadora persica, S. wightiana.
Senna indica.
Sida cordifolia.
*Sodium & Potassium tartrates & citrates.*

Solanum xanthocarpum* & S. indicum.
Sterospermum suaveolens.
*Sulphates of Potassium, of sodium,*
*Sulphur* (& of *magnesium; carbonate* (& *oxide of magnesium.*
Tamarindus indica.*
Taraxacum officinale (cholagogue purgative).
Terminalia species.*
Trianthema monogyna.
Trichosanthes cucumerina; T. cuspida; T. dioica; T. laciniosa; T. palmata (drastic purgative); T. nervifolia.
Uraria lagopoides.
Vitis venifera.*
Zizyphus jujuba; Z. laccifera & Z. napeca.

## PUSTULANTS:—

Aegle marmelos.
Andropogon species.
Bassia latifolia.
Boswellia serrata.
Buchanania latifolia.
Butea frondosa.
Calotropis giganta.
Cedrela toona.
Cinnamomum tamala.
Cissempelos hexandra & C. hernandifolia.
Croton tiglium.
Ficus Bengalensis; F. glomerata & F. religiosa.
Gloriosa superba.
Glycerrhiza glabra.
Mangifera indica.
Mimosa pudica; & M. sylvatica.
Mimusops elangi.
Nauclea cadamba.
Nelumbium speciosum.
Nerium odorum & N. oleander.
Picrorrhiza kurroa.
Plumbago zeylanica.
Pongamia glabra.
Ricinus communis.
Rubia cordifolia.
Semecarpus anacardium.
Spondias mangifera.
Symplocos racemosa.
Terminalia arjuna.
Woodfordia floribunda.
Zizyphus jujuba.

## REFRIGERANTS:—See also:—Diaphoretics, etc., Sudorifics.

Acorus calamus.
Adansonia digitata.
Andropogan muricatus.
Aloe indica & A. litoralis.
Asparagus racemosus.
Borassus flabelliformis.
Cicer arietinum.
Citrullus vulgaris.
Citrus bergamia.
Cocculus cordifolius.
Cocos nucifera.
Coriandrum sativum.
Cyperus rotundus & C. pertanuis.
Embelia ribes.
Glycerrhiza glabra.
Hemidesmus indicus.
Hibiscus rosa-sinensis.
Nelumbium speciosum.
Nymphæa stellata; N. rubra; N. alba; N. odorata; & N. cyanea.
Oldenlandia herbacea.
Pavonia odorata.
Piper longum.
Plumbago zeylanica.
*Potassium nitras.*
Pterocarpus santalinus.
Punica granatum.
Rosa damascena.

Santalum album.
Sugar.
Tamarindus indica.
Trichosanthes dioica.
Vitus vinifera.
Zingiber officinale.

**RUBEFACIENTS & COUNTER-IRRITANTS:—**

Anacardium occidentale.
Andropogon citratum.
Anisomeles malabarica.
Argyreia speciosa.
Beliospermum (croton) montanum.
Capsicum fastigiatum.
Chavica betle; C. officinarum; C. roxburghii.
Croton oblongifolius & C. pavana.
Euphorbia antiquorum, & E. tirucalli.
Gynandropsis pentaphylla.
Jatropha curcas & J. glandulifera.
Moringa pterygosperma.
Myrica sapida.
Myristica malabarica & M. officinalis.
Piper nigrum.
Plumbago rosea, & P. zeylanica.
Salvadora wightiana.
Semecarpus anacardium.
Sinapis juncea.
Vateria indica.

**RUBEFACIENTS & IRRITANTS:—See also:— Vesicants.**

Allium sativum.
Andropogan muricatus.
Argemone mexicana.
Calophyllum inophyllum.
Caryophyllus aromaticus.
Cleome viscosa.
Ferula asafœtida.
Glycyrrhiza glabra.
Moringa pterygosperma.
Nymphæ lotus.
Pimpinella anisum.
Piper longum, & P. nigrum.
Plumbago zeylanica.
Plumeria acuminata.
Psoralea corylifolia.
Pterocarpus santalinus.
Rubia cordifolia.
Rumex vesicarius.
Semecarpus anacardium.
Sinapis juncea.
Zingiber officinale.

**SALINES:—See Laxatives & Purgatives.**

**SAPONINS & SAPOTOXINS: —These are contained in:—**

Acacia concinna.
Celastrus paniculata.
Cratæva religiosa.
Randia dumetorum.
Sapindus trifoliatus.

**SEDATIVES: (Cerebral & local):—(See also:—Hypnotics, Narcotics, and Anodynes).**

Achyranthes aspera.
Amomum subulatum.
Berberis aristata.
Borax.
Cardiospermum helicacabum.
Cinnamomum camphora.
Clitoria ternatia, & C. marina.
Curcuma longa.
Datura alba, & D. fastuosa.
Embelia ribes.
Ferula fœtida.
Hyoscyamus niger.
Moringa pterygosperma.
Nardostachys jatamansi.
Nigella sativa.

Ocimum basilicum; O. sanctum; O. gratissimum and O. villosum.
Papaver somniferum.
Piper longum; P. nigrum; & P. aurantiacum.
Rauwolfia serpintina.
Salvadora persica.
Sinapis alba, & S. nigra.
Sodium chloride, & S. impura.
Xanthoxylon alatum.
Zingiber officinale.

**SEDATIVES:—**

**(Pulmonary):—**

Costus speciosus.
Curcuma zerumbet.
Emblica officinalis.
Phyllanthus niruri.
Rhus succedania.
Solanum xanthocarpum, & S. indicum.
Terminalia chebula.
Zizyphus jujuba.

**SEDATIVES:—**

**(Vascular).**

Aconitum ferox *(also cardiac and cerebro-spinal)*.
Andropogon muricatus.
Brassia latifolia.
Cocculus cordifolia.
Eucalyptus globulus (cerebro-spinal).
Glycerrhiza glabra.
Gmelina arborea.
Hemidesmus indicus.
Ichoncarpus frutescens.
Lactuca scariola (cerebro-spinal).
Nicotina tabacum (also cardiac).
Nymphæa stellata.
Pavonia odorata.
*Potassium nitras* (also cerebro-spinal).
Prunus padus.
Pterocarpus santalinus.
Santalum album.

**SEDATIVES:—Nervine:—**

Commiphora molmol.
Ferula fœtida.
Valeriana officinalis.

**SEDATIVES:—Uterine; & Astringents:—**

Berberis aristata.
Bombax malabarica.
Hibiscus rosa-sinensis.
Premna integrifolia.
Terminalia arjuna.

**SIALAGOGUES:—**

Anacyclus pyrethrum.
Aristolochia reticulata.
Ascelpias asthmatica, & A. curas-savica.
Brassica alba.
Chrysanthemum roxburghii.
Erythroxylon coca.
Gentiana lutea.
Glycyrrhiza glabra.
*Hydrargyrum.*
Hyperanthera pterygosperma.
Jateorhiza palmata.
Jatropha curcas.
Menespermum fenestratum, & M. hirsutam.
Myrica sapida.
Nicotina tabacum.
Piper species.
Plumbago rosea, & P. Zeylanica.
Pyrethrum radix.
Sinapis juncea.
Solanum jacquini.
Swertia chirata.
Zingiber officinalis.

**SOOTHING:—**

Aplotaxis auriculata.
Asparagus racemosus.
Bamboo-manna.
Bombax malabaricum.
*Ghee.*
Glycyrhiza glabra.
*Mel depuratum.*
Oleum sesami.
Plantago ovata.
Saccharum officinarum.
Terminalia Balerica.

**SOPORIFICS:—See "Hypnotics", etc.**

**STERNUTATORIES:—See "Errhines".**

**STIMULANTS:—See also "Carminatives",**

**"Antispasmodics" & "Tonics". (Respiratory):—**

Anacardium occidentale.
Andropogon species.
Arrack (country-spirit).
Bassia latifolia, & B. longifolia.
Borassus flabelliformis.
Cannabis sativa.
Caryota urens.
Celastrus paniculata.
Cocos nucifera.
Costus speciosum.
Curcuma zerumbet.
Elettaria cardamomum.
Ferula asafœtida.
Nardostachys jatamansi.
Ocimum sanctum.
Peganum harmala.
Phyllanthus niruri.
Rubia cardifolia.
Rumex vesicarius.
Salix capræa.
Salvadora wightiana.
Vitex nigundo, & V. trifolia.

*(Spinal).*

Buchanania latifolia.
Ficus glomerata.
Grewia asiatica.
Hordium hexactichon.
Oriza sativa, ( variety of).
Phœnix sylvestris.
Punica granatum.
Sacharum officinarum.
Zizyphus jujuba.

*(Vascular).*

Acorus calamus.
Aquilaria agallocha.
Capsicum annam.
Cassia auriculata.
Cinnamomum camphora.
Ferula asafœtida (also cerebro-spinal).
Myristica malabarica.
Piper longum.
Premna serratifolia.
Ptychotis ajowan.
Solanum xanthocarpum.
Tabernamonatacoronaria.
Thea assamica.
Zingiber officinale.

*(Cerebro-spinal).*

Allium sativum.
Cannabis indica.
Castoreum.
Erythroxylon coca.
Moschus moschiferus.
Nardostachys jatamansi.
Papaver somniferum.
Saussurea auriculata.
Strychnos nox-vomica.

**STIMULANTS CARDIAC:—**

Camphora officinarum.
Cane-sugar.
Digitalis lanata; D. purpurea.
Ephedra vulgaris.
Glucose.

**STIMULANTS—GENERAL:—**

Allium cepa, & A. sativum.
Alpinia galanga.

Anacyclus pyrethrum.
Andrographis paniculata.
Aplotaxis auriculata.
Caryophyllus aromaticus.
Citrus medica.
Clerodendron siphonanthus.
Coffea arabica.
Coriandrum sativum.
Crocus sativus.
Dryobalanops aromatica.
Gaultheria fragrantissima.
Melia azadirachta.
*Moschus moschiferus.*
Myristica fragrans.
Piper nigrum, & P. longum.
Terminalia arjuna.
Woodfordia floribunda.
Zingiber officinale.

**SPECIAL STIMULANT APPLICATIONS IN AFFECTIONS OF THE EYE:—**

Argemone mexicana (juice).
Berberis lycium (extract).
Cassia absus, & C. Auriculata (powdered seeds).

**STIMULANTS IN RHEUMATISM, ETC.:—**

**See:—"Rubefacients".**

**STIMULANTS IN SKIN DISEASES:—**

Argemone mexicana.
Bignonia xylocarpa.
Cassia alata; & C. occidentalis; C. Sophora; & C. Tora.
Ficus bengalensis.
Pinus deodara.
Pongamia glabra.
Rhinacanthus communis.
Santalum album.
Thespesia populnea.
Tiaridium indicum.

**STIMULANTS—TEREBINTHINATE:—**

Ailanthus malabarica.
Balsamodendron mukul, & B. pubescens.
Boswellia floribunda.
Calophyllum inophyllum.
Canarium commune, & C. strictum.
Dipterocarpus lævis.
Dorenea aureum.
Pinus deodara, & P. longifolia.
Pictacia cabulica, & P. Khinjuk.
Shorea robusta.
Vateria indica.

**STIMULANTS TO ULCERS, ABSCESSES ETC.:**

Argemone Mexicana.
Azadirachta indica.
Borassus flabelliformis.
Eupatorium ayapana.
Gardenia gummifera.
Hydrocotyle asiatica.
Mirabilis jalapa.
Myristica malabarica.
Vitex negundo, & V. trifolia.

**STIMULANTS—UTERINE:—**

Allium sativum.
Alpinia galanga.
Anethum sowa.
Balsamodendron mukul, & B. myrrha.
Bambusa arundinacea.
Cinnamomum camphora, & C. zeylanicum.
Ruta graveolens.
Semecarpus anacardium.
Sesamum indicum.

**STOMACHICS:—See:**

**"Bitters & Bitter Tonics," & "Carminatives".**

Aconitum heterophyllum.

Acorus calamus.
Adansonia digitata.
Aegle marmelos.
Alstonia scholaris.
Andrographis paniculata.
Anethum sowa.
Anthemis nobilis.
Artemisia maritima.
Asparagus adscendens.
Berberis aristata.
Bœrrhavia diffusa.
Capparis trifolia.
Carica papaya.
Carum carui.
Caryophyllus aromaticus.
Cassia fistula.
Cedrus deodara.
Cinchona cortex.
Cissampelos hexandra.
Citrus indica.
Cocculus cordifolius.
Coptis teeta.
Cuminum cyminum.
Curcuma longa, & C. zedoaria.
Cyperus rotundus.
Eclipta alba, & E. verbesina.
Elettaria cardamomum.
Embelia ribes.
Emblica officinalis.
Erythroxylon coca.
Ferula asafœtida.
Ficus glomerata.
Flacourtia cataphracta.
Fœniculum vulgare.
Gentiana kurroa.
Glycerrhiza glabra.
Gmelina arborea.
Hibiscus abelmoschus; H. populnea; & H. rosa-sinensis.
Holarrhena antidysenterica.
Hydrocotyle asiatica.
Hyssopus officinalis.
Melia azadarach.
Mentha sylvestris.
Mesua ferrea.
Momordica charantia; M. myxa; & M. dioica.
Picrorrhiza kurroa.
Pimpinella anisum.
Pinus webbiana.
Piper longum; P. chaba betle; P. nigrum; & P. aurantiacum.
Plumbago zeylanica.
Premna herbasea; P. integrifolia; & P. serratifolia.
Ptychotis ajowan.
Pyrus malus.
Quassia excelsa.
Rheum emodi.
Scindapsus officinalis.
Sida cordifolia.
Siegesbeckia orientalis.
Sinapis alba.
Stercospermum suaveolens.
Strychnos nux-vomica, & S. potatorum.
Swertia chirata.
Tamarindus indica.
Terminalia chebula.
Trigonella fœnum-græcum.
Uraria lagopoides.
Zingiber officinalis, & Z. zerumbet.

**STYPTICS: See:—**
**"Hœmostatics".**

**SUDORIFICS:—See**
**"Diaphoretics"; Refrigerants;**

**TANNIN—containing plants.**

Acacia arabica, & A. catechu.
Aegle marmelos.
Areca catechu.
Bauhinia variegata.
Eugenia jambolana.
Mangifera indica.
Mesua ferrea.
Mimusops elengi.
Myrica sapida.
Punica granatum.
Quercus infectoria.
Saraca indica.

Terminalia arjuna, & T. tomentosa.
Woodfordia floribunda.
Zizyphus vulgaris.

### TISSUE BUILDERS:—See also "Tonics".

Emblic myrobalan.
Bamboo manna.
Tinospora cardifolia (satwam) of.
Withania somnifera.

### TONICS: Aromatic & Bitter.

(See also:—Bitters & Bitter Tonics).
Aconitum heterophyllum.
Acorus calamus.
Ailanthus excelsa.
Andrographis paniculata.
Antiaris saccidora.
Aristolochia indica.
Artemisia indica.
Berberis asiatica & species.
Brucea (Nima) quassioides.
Cæsalpinia bonducella.
Chrysanthemum roxburghii.
Cicendia hyssopifolia.
Cissampelos pareira.
Clerodendron infortunatum.
Cocculus villosus.
Coptis teeta.
Cordia latifolia, & C. myxa.
Corydalis govaniana.
Coscinium fenestratum.
Cratæva religiosa.
Cyperus pertenius, & C. rotundus.
Erythræa roxburghii.
Eupatorium ayapana.
Exacum bicolor; E. pedunculatum; & E. tetragonum.
Ficus oppositifolia.
Gentiana kurroo.
Luffa amara.
Mesua ferrea.
Michelia champaca.
Ophelia angustifolia; O. Chirata; O. densifolia; & O. felegans.
Ophiorrhiza mungos.
Ophioxylon serpentinum.
Papaver somniferum's nocitine.
Picrorrhiza kurrooa.
Rhazya stricta.
Sida acuta, & S. cordifolia.
Strychnos nux-vomica.
Swertia chirata.
Thalidrum foliolosum.
Tinospora cordifolia, & T. crispa, (cardiac).
Toddalia aculeata.
Trichosanthes cordata, T. nervifolia; & T. palmata.

### TONICS: ASTRINGENT. (See also:—"Astringents"; "Nutritives" & "Tissue-Builders.)

Alstonia scholaris.
Arum campanulatum.
Azedirachta indica.
Cedrela toona.
Diospyros melanoxylon.
Flacourtia cataphracta.
Holarrhena antidysenterica, & H. Pubescens.
Hymenodictyon excelsum.
Mimusops elengi.
Nauclea ovalifolia.
Rhus succedanea.
Soymida febrifuga.
Terminalia chebula.
Xylocarpus granatum.

### TONICS:—(See also "Nutritives"; Alternatives; & "Tissue -Builders" & Stimulants.

Allium sativum.

Ambra grisea.
Amygdalus dulcis (See: Prunus amygdalus).
Anthemis nobilis.
Aquilaria agallocha.
*Arsenious acid* (nervine).
Arum campanulatum.
Asparagus racemosa.
*Asphaltum* (nervine).
*Auram, calcined.*
Balsamodendron mukul.
Bambusa arundinacea.
Barleria prionitis.
Bassia latifolio; longifolia; & butyracea.
Bauhinia variegata.
Benincasa cerifera.
Berberis aristata.
Brassica campestris, & B. juncea (nervine).
Buchanania latifolia.
Cæsalpinia digyna.
Calotropis gigantea.
Canscora decussata (nervine).
Casearia esculenta.
*Cinnabar.*
Cinnamomum camphora.
Clerodendron siphonanthus.
Cocculus cordifolia.
Convolvulus paniculatus.
Cordia latifolia, & C. myxa.
Coriandrum sativum.
Curculigo orchioides.
Curcuma longa.
Desmodium triflorum.
Eclipta erecta.
Embelia ribes.
Emblic myrobalam.
Erythroxylon coca.
Eugenia jambolana.
*Ferri sulphas.*
*Ghee.*
Glycyrrhiza glabra.
Gmelina arborea.
Gymnema balsamicum, & G. lactiferum.
Gynocardia odorata.
Hemidesmus indicus.
Herpestis monniera (nervine).
Hydnocarpus wightiana.
Hydrocotyle asiatica.
Hygrophila spinosa.
Ichnocarpus frutescens.
Ipomœa digitata, & I. batatas.
Lansonia alba.
Melia azadirachta.
Mimosa pudica.
Mimisops elengi.
*Moschus moschiferus.*
Mucuna pruriens.
Nardostachys jatamansi (nervine).
Nerium odorum.
Onosma species.
Pedalium murex.
Phaseolus trilobus.
Phœnix sylvestris.
Phyllanthus emblica.
Pistacia vera.
Prunus amygdalus (*See:*— Amygdalus dulcis).
Pterocarpus santalinus.
Pyrethrum radix.
Rubia cordifolia.
Saccharum purificatum.
Saraca indica.
Semecarpus anacardium.
Sesamum indicum.
Sida rhombifolia.
Smilax china or chinensis.
Stereospermum suaveolens.
Strychnos nux-vomica (nervine).
*Sulphur sublimatum.*
Symplocos racemosa.
Tacca aspera.
Terminalia belerica; T. chebula.
Tinospora cordifolia; T. crispa.
Tribulus terrestris.
Trichosanthes dioica.
"Triphala."
Uraria lagopoides.
Vanda roxburghii.

Vitis vinifera.
Withania somnifera.

**(CARDIAC):—**

Acacia catechu.
Adhatoda vasica.
Aplotaxis auriculata.
Apocynum cannabinum.
Artocarpus lakoocha.
Carissa corundas.
Citrus medica.
*Coccus lacca.*
Digitalis purpurea, & D. lanata.
*Hydrargyrum.*
Mangifera indica.
*Mel depuratum.*
Melia azadirachta.
Moringa pterygosperma (diuretic).
Prunus species.
Punica granatum.
Rumex vesicarius.
Spondiac mangifera.
Strophanthus gratus, & S. combe.
*Sulphate of Iron* (haematinic).
Tamarindus indica.
Terminalia arjuna.
Urginea scilla.

**TRIDOSHAHARAM:—**

Emblic myrobalan.
*Moschus moschiferus.*
Solanum xanthocarpum.
Tinospora cordifolia.

**UTERINE CONTRACTERS:—**

**See "Ecbolics", or "Oxytocics" etc.,**

**UTERINE SEDATIVES & ASTRINGENTS:—See:—**

**"Sedatives".**

**UTERINE STIMULANTS:— See:—Stimulants.**

**VERMICIDES:—See "Anti-parasitics", & Anthelmentics".**

**VERMIFUGES:—See "Anthelmintics".**

**VESICANTS: See also:— "Rubefacients", "Irritants", & "Counter-irritants".**

**VESICANTS:—**

Epicauta nipalensis.
Lytta assamensis; L. gigas; L. violacea.
Meloe trianthema.
Moringa pterygosperma.
Mylabris cichorii; M. punctum; M. pustulata; & other species.
Plumbago rosea, & P. zeylanica.
Salvadora wightiana.
Semecarpus anacardium.
Sinapis juncea.

**VOLATILE AND FIXED OILS ARE DERIVED FROM:—**

Achyranthes aspera.
Acorus calamus.
Acquilaria agallocha.
Aleurites moluccana.
Allium cepa, A. sativum.
Aloe vera.
Alpinia galanga.
Andropogon citratis; A. laniger; A. muricatus.
Apium graveolens.
Arachis hypogea.
Argemone mexicana.
Bassia longifolia.
Blumea balsamifera.

Brassica alba; B. juncea; & B. nigra.
Canarium commune.
Capsicum nepalensis.
Carthamus tinctorius.
Carum copticum; C. carui.
Cassia auriculata.
Celastrus paniculata.
Cinnamomum cassia; C. camphora; & C. zeylanicum.
Citrus acida.
Cocos nucifera.
Coriandrum sativum.
Crocus sativum.
Croton tiglium.
Cuminum cyminum.
Curcuma aromaticus; C. longa; & C. zedoaria.
Cymbopogon citratus; C. flaxuosus; & C. pachnodes.
Elettaria cardamomum.
Embelia ribes.
Erythroxylon monogynum.
Eucalyptus globulus.
Eugenia caryophyllata.
Ferula fœtida.
Fœniculum vulgare.
Garcinia morella.
Gaultheria fragrantissima.
Guizotia abyssynica.
Helianthus annus.
Hibiscus sabdariffa.
Hymenodictyon excelsum.
Jatropha curcas.
Juniperus communis; J. oxycedrus.:
Linum usitatissimum.
Liquidamber orientalis.
Mallotus philippinensis.
Melaleuca leucadendron.
Melia azadirachta.
Mentha arvensis.
Michelia champaca.
Myristica fragrans.
Nicotiana tabacum.
Nyctanthes arbortristis.
Ocimum sanctum.
Pæderia fœtida.
Pandanus odoratissimum.
Papaver somniferum.
Pimpinella anisum.
Pinus deodara.
Piper betle; P. chaba; P. cubeba; P. longum; & P. nigrum.
Pongamia glabra.
Pseudanum graveolens.
Psoralea corylifolia.
Pterocarpus marsupium.
Ptychotis ajowan.
Raphanus sativus.
Ricinus communis.
Rosa damascena.
Rosemarinus officinalis.
Santalum album.
Sesamum indicum.
Sphœranthus indicus.
Styrax benzoin.
Terminalia catappa.
Valeriana jatamansi; V. wallichii.
Vitex negundo.
Zingiber officinale.

**VULNERARIES:—**

Bombax malabaricum.
Cocculus cordifolia.
Glycerrhiza glabra.
Grislea tomentosa.
Mimosa pudica.
Myrica sapida.
Stephania hernandifolia.
Symplocos racemosa.
Uraria lagopoides.

*PUBLICATIONS REFERRED:—*

(1) Guide to Indigenous Drugs (1949) by Dr. J. R. Goyal.
(2) "Halliya Vaidya", (Canarese) (1945), by Vaidya Madhvacharya Burli.

(3) Druary's Pharmacopœia of India, (old edition).
(4) Pharmocology, Materia Medica & Therapeutics (1949), by Dr. B. N. Ghosh.
(5) 100 Useful Drugs, (1927), by Dr. A. Lakshmipathi.
(6) Practical Bazaar Medicines, (1920), by Col. G. T. Birdwood.
(7) Students' Pharmacology & Materia Medica (1933), by Dr. V. G. Rele.
(8) Pharmacology & Therapeutics (1948), by Dr. M. A. Kamath.
(9) Catalogue 1950 of the Homœo-Chemical & Pharmaceutical Works, Ltd., & Laboratory, 22, Gorachand Road, Entally, Calcutta.
(10) Domestic Duty (1905), by Manmathanath Dutt.
(11) Forest Trees of Mysore & Coorg (1894), by John Cameron.
(12) A Treatise on Tropical Therapeutics (1950), by Col. R. N. Chopra.
(13) A Handbook of Ayurvedic Meteria Medica with principles of Pharmacology, & Therapeutics, Vol. I (1950), by Dr. H. V. Savnur.
(14) Aphrodisiac Remedies (1925), by Practical Medicine, Delhi.

## APPENDIX II.

### Drugs, Preparations and their specific and more important uses in diseases.

*Abelmoschus esculentus,* in bronchitic cough, and in diseases of the intestinal and genito-urinary organs.

*Abies webbiana,* in cough and phthisis.

*Abrak bhasma,* in combination with other drugs as a tonic in chronic diseases, such as diarrhoea, dysentery, fever, diabetes, anæmia, jaundice, etc.

*Abroma augusta,* in menstrual disorders, and dysmenorrhœa.

*Abrus precatorius,* in nervous debility and locally leucoderma, alopecia, sciatica, stiff joints, paralysis and obstinate cough.

*Abutilon indicum,* in diseases of the bladder and urethra.

*Acacia arabica,* in pulmonary and bronchial diseases, diarrhœa, piles, prolapse of rectum, gonorrhœa, typhoid fever, irritability of the genito-urinary organs, and leucorrhœa.

*Acacia catechu,* in diarrhœa, sore throat, mercurial stomatitis, and in ulcerations internally and externally.

*Acacia concinna,* in Asthma.

*Acacia senegal,* in bleeding piles and other hæmorrhages.

*Acalypha indica,* as an emetic.

*Acampe pappilosa,* in rheumatism, sciatica and neuralgia.

*Achillea millefolium,* for colds, promoting perspiration, and fevers.

*Achyranthes aspera,* in cough, asthma, enlarged spleen in malaria, painful menstruation and toothache, and occasionally in renal dropsies.

*Acipenser huso, etc.,* (Fishes) in chronic diarrhœa and debility.

*Aconitum ferox,* in fever, diarrhœa of children, cough, asthma, diabetes, nervous diseases, spermatorrhœa, and locally in neuralgia, rheumatism and guinea worms.

*Aconitum heterophyllum,* in dyspepsia and chronic fevers.

*Aconitum napellus,* internally in inflammatory fevers in early stages, and externally in neuralgia, sciatica, muscular rheumatism, and inflammatory joint affections.

*Acorus calamus,* in gastric and respiratory diseases, dyspepsia, dysentery, worms, to promote micturition and labour pains, and in tetany, epilepsy, wounds, ulcers, vomitting, hysteria and spasmodic complaints.

*Adansonia digitata,* in dysentery, diarrhœa, dyspepsia, acid eructations and externally painful joints, and syphilitic ulcers.

*Adeps,* (Lard), in excoriations, burns and scalds.

*Adhatoda vasica,* in cough, asthma, bronchitis, pertussis, tuberculosis of lungs, (respiratory spasmodic diseases) and ague fever.

*Adiantum capillus veneris,* for coughs, hoarseness, and colds.

*Aegle marmelos,* in chronic obstinate, mucous and catarrhal diarrhœa, dysentery, and scurvy, and early stage of sprue and consumption, and typhoid, chronic constipation, and certain forms of dyspepsia.

*Agati grandiflora*, in enteric fever.

*Agrimonia euphatoria*, in coughs, diarrhœa, relaxed bowels, kidney and liver derangements.

*Agropyrum repens*, in cystitis, nephritis, and bladder complaints, generally; also for gout and rheumatism.

*Ailanthus excelsa*, for debility.

*Alangium lamarckii*, to produce temporary fall of blood pressure, and to increase the tone and peristaltic movement of the intestine.

*Aleurites moluccana*, as an aphrodisiac.

*Allium cepa*, in bronchial complaints, piles, infantile, epileptic and hysterical fits.

*Allium sativum*, in acid dyspepsia, hiccough, infantile convulsions, tetany and nervous affections; oil externally in paralysis.

*Alocacia indica*, in anasarca and dropsy.

*Aloe barbadensis*, in eye affections and internally in piles, coughs and colds, and as an external application to inflamed and painful parts of the body.

*Aloe indica or A. litoralis*, in internal and external inflammations, constipation, bleeding piles, and dysentery, hysterical fits, and flatulency.

*Aloe vera*, in lymphatic glands.

*Alpinia officinarum*, in dyspepsia, preventing fermentation and removing flatulence.

*Alstonia scholaris and A. constricta*, in catarrhal and malarial fevers and chronic bowel complaints (diarrhœa, dysentery).

*Althœa officinalis*, for coughs, colds, bronchitis, ascites, anasarca, asthma, gout, dysentery, kidney trouble, inflammation of lungs, intestines and bladder, and is invaluable for poultices.

*Alumen and its preparations*, in hæmoptysis, epistaxis, menorrhagia, chronic diarrhœa, and dysentery, diarrhœa of phthisis and cholera, gastro-intestinal, renal, uterine and genito-urinary catarrah and hæmorrhages, vaginitis, leucorrhœa, bleeding piles, strangury, gleet, vomitting, hiccough, asthma, croup and whooping cough, narcotic poisoning, serpent bite, malaria, concussion of the brain and spinal cord fractures, painful joints, lead colic, guinea-worm, enteric fever, diabetes, albuminuria, and externally in epistaxis, gums, vagina, rectum, cuts, etc., ulcers, bed-sores, fissures,

sore-eyes, recent-ecchymoses, aphthæ, thrush, eczema, sweating feet, etc., prolapsus of the anus, urethral discharge, scorpion bites, etc.

*Amarantus spinosus* as a diuretic.

*Ambra grisea,* in general and nervous debility, epilepsy, spasms, high fevers with delirium and collapse.

*Ammonium chloride,* in hepatic congestion and dropsy, (enlarged liver and spleen), colic, tetany, alkalosis, jaundice, billiousness, laryngeal, bronchial, pulmonary, vesical, gastro-intestinal, and genito-urinary catarrhs and inflammations, intermittent fevers, neuralgias, and externally headache, mania, and apoplexy, chronic rheumatism, inflamed erysipelas and hernial tumours, enlarged glands, abcesses, milk abcesses, chronic skin diseases, bruises, and blows on the eye, etc., cataract, scorpion bites etc.

*Amomum subulatum,* as a carminative.

*Amorphophallus campanulatus,* in hæmorrhoids and piles.

*Amorphophallus sylvaticus,* in piles, dyspepsia, debility, amenorrhœa, and locally boils and opthalmia.

*Anacyclus pyrethrum,* in nerve affections, chronic bowel affections, and seminal debility.

*Anamirta cocculus,* in pediculi.

*Ananas sativus,* in gastric irritability and billiousness, and as an anthelmintic.

*Andrographis paniculata,* in general debility, convalescence, dysentery, diarrhœa, dyspeptic conditions, kalazar, children's torpidity of liver and constipation.

*Andropogan citratis,* in colds, catarrhs, vomitting and fevers, flatulent and spasmodic affections of the gastro-intestinal tract and externally in lumbago, rheumatism and neuralgia.

*Anemone obtusiloba,* externally as a blistering agent.

*Animal flesh preparations,* in convalescence, hysteria, paralysis, insanity, cephalalgia, and other nervous diseases, cough, phthisis, eye and ear diseases, and externally convulsions, paralysis and wasting of limbs.

*Anisomeles Malabarica,* in catarrh, intermittent fevers and gastro-intestinal affections.

*Annona squamosa,* in tumours.

*Anthemis nobilis*, (See also:—Matricaria chamomilla), for hysteria and nervousness in women and as a tonic for debility.

*Antiaris toxicaria*, in dysentery, and as an arrow-poison, and *by regulated doses* for cardiac failure.

*Aqua stychetis*, in acidity.

*Arachis hypogeæ*, is a tonic and is used in piles.

*Areca catechu*, in worms, diarrhœa, tape-worm, watery discharges from genito-urinary organs, and bleeding gums.

*Argemone mexicana*, for herpetic eruptions.

*Argyreia speciosa*, as tonic in dullness of intellect, emaciation, infirmity of old age, and externally in abscesses.

*Aristolochia bracteata*, for maggots in the nose, syphilis, gonorrhœa and skin diseases.

*Aristolochia indica*, in venemous insect bites and internally in intermittent fevers and bowel complaints.

*Aristolochia serpentaria*, very efficacious in feverish conditions, antispasmodic tonic and nervine.

*Arsenic (Bisulphuret of)*, in fevers, coughs, asthma, and skin diseases, and locally fistulous sores and other skin diseases, cephalalgia, ozena (ozœna) and coma.

*Arsenic (Trisulphuret* of), in chronic fevers, skin diseases, incipient phthisis, coughs, asthma, paralysis, epilepsy, dropsy, and externally warts, corns, leprous ulcers and as a depilatory.

*Arsenious acid*, in chronic fevers, liver complaints, lienteric diarrhœa, neuralgias, chorea, enlarged lymphatic glands, obesity, chronic coryza, and externally cancer, lupus, parasitic diseases, asthma, cough and impotence.

*Artemisia absinthium*, good for enfeebled digestion, and consequent debility, also expels worms in children.

*Artemisia maritima*, as a stomachic, and in round worms.

*Artemisia species*, in dyspepsia, hysteria, epilepsy, nervous irritability, depression and exhaustion, worms as stomachic, and externally skin diseases, foul ulcers and as snuff in headache.

*Artemisia vulgaris*, for female irregularities, nervous and spasmodic affections.

*Asparagus species*, in boils, general debility, (to increase manly vigour), leucorrhœa, epilepsy, hysteria, calculus affections, gastro-intestinal disorders, colic, etc.

*Asphaltum,* in genito-urinary diseases, gallstone, renal stone, anuria, jaundice, enlarged spleen and liver, fermentative-dyspepsia, round worms, piles, anasarca, obesity, nervous diseases, uterine troubles, scrofula, tuberculosis, leprosy, eczema, elephantiasis, anæmia, anorexia, asthma of gouty people, phosphaturia (contra-indicated in uric acid calculus), ascites, uræmia, cholæmia, chyluria, albuminuria, chronic cystitis, diabetic amaurosis, and locally rheumatic arthritis, paralysis, contusions, sprains, and bruises.

*Astercantha longifolia,* in dropsy, rheumatism and urinary affections.

*Atropa belladonna,* internally, in intestinal obstruction, heart ailments, spasmodic affections, night-sweats of phthisis, renal calculus and externally in sciatica, piles, female ailments, and eye complaints.

*Aurum (prepared),* in chronic fevers, consumption, insanity, and other diseases of the nervous system and of the urinary organs, hysteria, epilepsy, leprosy, asthma, dyspepsia, amenorrhœa, sterility, habitual abortion, chronic Bright's disease, chronic metritis, chronic and obstinate dysentery, syphilis, scrofula and impotence.

*Averrhœa carambola,* in scanty micturition.

*Azadirachta indica, (extract),* in periodic fever, (malaria), and suppuration, for foul ulcers and chronic skin diseases, round and thread worms.

*Balsamodendron mukul,* in abscesses, and rheumatic, nervous, scrofulous, urinary and skin diseases.

*Balsamodendron myrrh,* in dyspepsia, stomatitis, chest complaints, amenorrhœa, and other atonic uterine affections, and externally in thrush, guinea-worm, inflammations and ulcers.

*Balsamodendron opobalsamum,* in genito-urinary diseases and locally indolent ulcers, cuts and bleeding wounds.

*Bambusa arundinacea,* in thread worms and internally bronchial (cough and asthma), consumption, fevers, to promote micturition, spasmodic affections.

*Banga bhasma,* is a general tonic and alterative used in diabetes, anæmia, and skin diseases.

*Barringtonia acutangula,* etc., in small doses in colds, catarrhs, headaches and ophthalmia and to promote vomiting in children.

*Basella species,* in catarrhs of the bronchial and genito-urinary tracts and externally in headaches, and insomnia.

*Bassia latifolia*, in skin diseases, cephalalgia, and internally rheumatic affections and general debility.

*Bauhinia variegata*, in worms, piles, diarrhœa, dysentery, dyspepsia, flatulence, coughs, scrofulous affections and skin-diseases.

*Beninkasa cerifera*, in internal hæmorrhages, nervous and spasmodic diseases, vegetable poisons, dyspepsia and biliousness.

*Berberis aristata*, in malarial fevers, with biliousness, jaundice, blood-pressure, liver and spleen diseases, piles, and locally leucorrhœa, Delhi-boils, menorrhagia, and eye affections.

*Berberis asiatica*, in leishmania, cardiac complaints, and oriental sores.

*Berberis vulgaris*, in jaundice and liver complaints, indigestion and constipation.

*Betula alba*, a bitter astringent, used for skin diseases and eczema,—can be used internally or externally.

*Bezoar*, in abortion, measles, typhoid, piles and skin diseases.

*Bixa orellana*, in dysentery, gonorrhœa, and fevers.

*Blumea species*, in cough.

*Bœrhavia diffusa*, in asthma, anæmia, inflammatory and dropsical affections, hepatic disorders, rheumatic and gouty complaints, kala-azar and chronic peritoneal conditions, heart-diseases, and kidney ailments.

*Bœrrhaavia repens*, in dropsy due either to cirrhosis of the liver or when associated with kala-azar, and ascites due to chronic peritoneal conditions.

*Bombax Malabaricum*, in diarrhœa, dysentery, menorrhagia, gonorrhœa, calculi, renal and bladder inflammation and ulcerations.

*Bombyx mori*, in profuse menstrual flow, leucorrhoea, chronic diarrhœa, eye diseases, and catarrh.

*Borago officinalis*, for fevers and chest trouble.

*Boswellia glabra*, etc., in rheumatic, scrofulous and spyhilitic affections, piles, cough, influenza, enlarged scrotum due to injury, urinary, uterine, and pulmonary diseases.

*Boswellia serrata*, in bronchitis and chronic laryngitis.

*Brassica alba*, for hip baths in fevers, cerebral congestions, stimulant, cataplasm and sinapism, and internally in

nervous complaints, indigestion, flatulence, costiveness, colic and dropsy.

*Brassica campestris,* used for *culinary and .anointing purpose.*

*Brassica juncea,* in rheumatic and chest affections.

*Brassica nigra,* as digestive condiment, in gouty, rheumatic, inflammatory and febrile cases.

*Brunella vulgaris,* is used as a stimulant expectorant.

*Bryonia epigœa,* in diabetes, rheumatic and syphilitic complaints.

*Bryphyllum calcinum* or *B. pinnatum* in boils, wounds, bruises and bites of insects.

*Butea frondosa,* and B. monosperma, in diarrhœa, dysentery, dyspepsia, and round and tape worms and externally in skin diseases (ringworm) swellings and ulcerations.

*Butter,* in consumption and piles.

*Cœsalpinia bonduc,* in malarial fevers, debility, epileptic fits, hysteria, as antidote against opium, aconite, arsenic, and copper poisoning; gastric and hepatic disorders, and externally in inflammations and guinea-worms.

*Calcium and its salts,* in enlarged spleen, jaundice, urinary troubles, acid dyspepsia, heartburn, infantile diarrhœas, scrofula, consumption, menorrhagia, and externally fractures, and painful swollen parts, headaches, gouty joints, bites of rabid dogs, ringworm, Dhobie's itch, etc., warts, small-pox, burns and scalds, sore and cracked nipples, chancres, scrofulous and other ulcers, leucorrhœa, and other vaginal discharges, prurites, ani, and pudendi erysipelas and other skin affections, and as a depilatory.

*Calcium oxide or Calx,* to prevent curdling of milk, heartburn, prosis, vomitting, pruritus valve and cracked nipples, & in gastric acidity.

*Calendula officinalis,* internally for fevers, to promote perspiration and to prevent suppuration.

*Calophyllum inophyllum,* in genito-urinary diseases.

*Calotropis gigantea and C. procera,* in constitutional and syphilitic affections, visceral enlargements, leprosy, asthma, fevers with enlarged liver and cough, and skin diseases.

*Camphora officinarum,* in eruptive and other fevers, spasmodic, chest, respiratory and cerebral affections, worms, colic, and bed sores.

*Cannabis sativa,* in all diseases requiring a stimulant, exhilarant, aphrodisiac and anodyne action.

*Capsella bursa-pastoris,* for kidney complaints, dropsy, and chronic diarrhœa.

*Capsicum annum,* in stomach-ache with acidity, and cholera.

*Capsicum frutescens,* in pharyngeal and gastro-intestinal diseases.

*Capsicum minimum,* in diarrhœa, constipation & dyspepsia.

*Cardiospermum helicacabum,* in urinary and nervous diseases, rheumatism, piles, amenorrhœa, and locally earache, rheumatism, and amenorrhœa.

*Carica papaya,* promotes menstruation and is used in croup, diphtheria, dyspepsia, enlarged spleen and liver, chronic diarrhœa, amobic dysentery, and round worms and other intestinal disorders, and externally elephantoid growths, and ringworm.

*Carthamus tinctorius,* for female irregularities, fevers and eruptive skin diseases.

*Caryota urens,* in seminal weakness, and urinary disorders and externally in hemicrania.

*Carum carui, or carvi,* in flatulence and colic.

*Carum copticum,* (Aqua ptychotis) in acidity, colic, flatulent dyspepsia, and spasmodic affections.

*Caryophyllus aromaticus,* in flatulence and indigestion.

*Cassia acutifolia,* to cleanse alimentary tract.

*Cassia alata,* etc., in poisonous insect bites and skin affections.

*Cassia angustifolia, & C. lanceolata,* in chronic constipation.

*Cassia fistula,* in ague, fever, gastric complaints, as constipation, flatulent colic, epistaxis, piles, scanty micturition, etc., and externally rheumatic and skin affections.

*Cassia occidentalis,* in dyspeptic symptoms, and externally in skin diseases and poisonous bites.

*Cassia sophora,* in bronchial, spasmodic affections, rheumatic and inflammatory fevers, and externally in skin diseases.

*Cassia tora,* in obstinate skin diseases, as ringworm, foul ulcers, etc.

*Castoreum,* in nervous debility, hysteria, epilepsy, asthma, muscular tremor, uterine colic and disorders.

*Cedrus deodara,* in bilious fevers, rheumatism, and atonic inveterate diarrhœa.

*Celastrus paniculatus,* oil used externally in painful joints, hemiplegia, ulcers, skin diseases and piles.

*Centella asiatica, (See also:—Hydrocotyle asiatica),* in skin diseases and as a tonic.

*Cephalandra indica,* in skin diseases and diabetes.

*Cera alba, etc.,* in ulcers, fistula in ano, etc.

*Cerbera manghas, (See also:—Cerbera odollum),* is purgative, emetic, used for criminal poisoning, and to raise blood pressure.

*Cervus dama, etc.,* and preparations, in painful affections of the joints and muscles, cardialgia, pleurisy, pleurodynia and other heart affections, cough, asthma, low fevers, seminal debility, dysentery, and locally sprains, contusions, cracks, and fissures, chronic skin diseases, orchitis and other enlarged glands.

*Cetaceum,* in alvine and urinary irritations and locally blistered and excoriated surfaces and ulcers.

*Chenopodium ambrosioides,* in ascaris and ankylostomum.

*Chondrus crispus,* in chest and bronchial affections, in irritating diseases of bladder and kidneys.

*Cichorium intybus,* in liver and spleen disorders.

*Cimisifuga, racemosa,* for rheumatism, female complaints, and glandular swellings, in children for diarrhœa, whooping cough and St. Vitus dance.

*Cinchona cortex,* in intermittent fevers, spleen enlargements, and as general gastric tonic during convalescence, etc.

*Cinchona succirubra,* a powerful tonic, extensively used in neuralgia, dyspepsia, and debility. Overdoses sometimes cause headache and giddiness.

*Cinnamomum camphora,* in lumbago, sciatica, chordee, spermatorrhœa, pruritus, asthma, delirium, insomnia, diarrhœa, ptomaine poisoning, prickly heat, sloughing ulcer and eczema of genitals.

*Cinnamomum cassia,* etc., as gastro-intestinal and uterine stimulant, and in influenza, and locally in rheumatic pains, headache, and toothache.

*Cinnamomum iners, etc.*, in fevers, flatulence, dyspepsia, and coughs.

*Cinnamomum Malabaricum*, in diarrhœa, dysentery, and coughs.

*Cinnamomum zeylanicum*, in flatulence, dyspepsia, diarrhœa, dysentery and fevers, and to stop nausea and vomiting.

Cessempelos Pereira, in dyspepsia, diarrhœa, mucous discharges from the intestines and bladder, nephrites and externally snake-bites, & scorpion stings.

*Citrullus colocynthis*, in hepatic, abdominal, visceral (dropsy dysentery, etc.,) and cerebral congestions, neuralgic affections, as a drastic purgative in constipation, fever and worms.

*Citrus acida*, in scurvy, as gargle for spongy gums, antidote to castor-oil and croton-oil poisoning, and locally for mosquito bites.

*Citrus aurantium*, in bilious and gastric disorders, scurvy, rickets, eczema, etc., and externally, in gout and rheumatism.

*Citrus bergamia*, in cholera, scurvy, scorbutic affections, internal hæmorrhages, rheumatic, dyspeptic and diabetic complaints, and externally in cutaneous irritations.

*Citrus medica*, in bilious fevers, dyspepsia and inflammatory affections.

*Cleistanthus collinus*, for foul ulcers.

*Cleome viscosa*, in worms, foul ulcers, maggots in the nose, otorrhœa, and internally in infantile convulsions.

*Clerodendron species*, in fevers, scrofulous and venereal diseases, worms, bronchial and pulmonary affections.

*Clitoria ternatia*, in croup, visceral enlargements, cystic and urethral irritations.

*Cocculus cordifolius*, in fevers, gastric disorders, general and seminal debility, liver and splenic enlargements, urinary diseases, rheumatic and syphilitic affections.

*Cocculus indicus*, as an ointment in obstinate skin diseases.

*Cocculus suberosus*, etc., in epileptic and paralytic affections, night sweats of phthisis and externally in parasitic skin diseases.

*Cocculus villosus*, in gonorrhœa, rheumatic and syphilitic cachexia, bilious dyspepsia and skin diseases.

*Coccus cacti*, in whooping cough, neuralgia, etc.

*Coccus lacca* preparations, in chronic fever, remittent fever, consumption, cough and dyspnœa, muscular rheumatism, epilepsy, hysteria, indolent, scrofulous and scorbutic ulcers.

*Cocos nucifera*, is good in hæmoptysis, chronic bronchitis, distention due to dyspepsia and promotes expulsion of worms, cocoanut ghee is good in hemiplegia, burnt shell ashes mixed in oil are useful in leucoderma, shell oil is useful in skin diseases, Ghee of cocoanut is almost equal to Cod-liver oil.

*Coffea Arabica*, in spasmodic and hysterical affections, chronic diarrhœa, and cholera infantum.

*Cola acuminata & C. vera*, good tonic for nerves, and safe and good for muscular weakness of heart.

*Commiphora myrrha*, decoction for sore and ulcerated throats, thrush, etc., as gargle and mouth-wash.

*Copper sulphate*, in granular lids, exuberant ulcers, conjunctivitis, gleet, leucorrhœa, chronic diarrhœa, diptheria, bronchitis, prickly heat, and opium poisoning.

*Coptis teeta*, as an application to sores, especially in the eyes.

*Corallium rubrum & its preparations*, in boils, broncho-pulmonary affections, low fever, genito-urinary diseases, scrofulous affections, carbuncle, nervous troubles, dyspepsia, biliousness, diabetes, impotence and general debility.

*Corallocarpus epigeous*, is an alterative in syphilis.

*Corchorus capsularis*, etc., in gastric catarrh, hepatic and intestinal colic, worms, genito-urinary diseases, visceral obstructions.

*Coriandrum sativum*, in flatulent colic, dyspepsia, bleeding piles, mucous diarrhœa, rheumatism, neuralgia, cephalalgia, and locally in eye affections.

*Cratœva nurvala*, in calculus, syphilis, renal and urinary complaints, scrofulous, grandular and internal inflammation, and locally ozœna and flatulence.

*Crocus sativus*, in headache, spasmodic coughs and catarrhs, and gastro-intestinal and uterine disorders, seminal debility, neuralgias, rheumatism and locally bruises and sores.

*Croton tiglium*, in dropsy, lead poisoning, cerebral hæmorrhage or convulsions and congestions, apoplexy, intestinal obstructions, and externally gout, rheumatism, arthri-

tis, lock jaw, mania, chronic laryngitis, bronchitis and to increase manly vigour.

*Cubeba officinalis,* in laryngeal, bronchial, leucorrhœa, genito-urinary, gonorrhœa, gleet, and cystitis and renal diseases.

*Cucumis species,* in inflammatory fevers, urinary irritation, and suppression and calculus affections.

*Cucurbita species,* in pulmonary hæmorrhages, and tape-worm.

*Cuminum cyminum,* in chronic diarrhœa, dyspepsia, hiccough, worms, gonorrhœa and urinary complaints.

*Cupri sulphas,* locally in exhuberant granulation, indolent ulcers, tinea-tersi, ringworm, and pseudo-membranous croup.

*Cuprum and its salts,* in chronic diarrhœa, and bacterial infections, sprue, typhoid fever, Tabes-mesenterica, bronchitis, asthma, and externally foul ulcers, sinuses, fistulæ, ringworm, conjectivitis and ophthalmia, epistaxis, excessive and obstinate hæmorrhages, leucorrhœa, burns from phosphorus and prickly heat.

*Curculigo orchioides,* in gonorrhœa, leucorrhœa, menstrual derangements, asthma, jaundice, diarrhœa, colic, seminal weakness, and delibility of old age.

*Curcuma amada,* in skin diseases, enlarged glands, spleen and liver.

*Curcuma angustifolia,* in gastro-intestinal inflammation, and ulceration, and urethral irritation.

*Curcuma aromatica,* in sprains, bruises and skin diseases.

*Curcuma longa,* in worms, jaundice, inflammations, wounds, bruises, insect bites, sore eyes, skin diseases, piles, sprains and bruises, and internally gastric disorders, (flatulence & dyspepsia).

*Curcuma zedoaria,* in malarial fevers, vomiting, hiccough, worms, flatulence, dyspepsia, pharyngeal and laryngeal inflammations, and discharges from genital organs, and locally skin affections.

*Cymbopogon citratus & C. flexuosus,* in lumbago, myalgia, chronic rheumatism, etc.

*Cynodon dactylon,* in vesical calculi, urinary irritation, dropsies, internal hæmorrhages, catarrh, ophthalmics, want of vitality.

*Cyperus species*, in remittent and chronic fevers, gastric derangements, diarrhœa, worms, and locally scorpion stings, and ulcers.

*Cypræa moneta*, in dyspepsia, jaundice, enlarged spleen and liver, asthma and cough, scalding in gonorrhœa, colic and other intestinal pains.

*Dalbergia spinosa*, roots-powder in a tumblerful of water, destroys effects of alcohol bordering on delirium tremens.

*Datura alba, & D. fastuosa, etc.*, in asthma, spasmodic lung-complaints, hydrophobia, dysmenorrhœa, maniacal affections, rheumatic pains, and locally painful and glandular inflammations, lumbago, pleurodynia, and abscesses.

*Datura stramonium*, internally in bronchitis and asthma.

*Daucus carota*, for dropsy, retention and irregularities of urine, gravel and other bladder affections.

*Desmodium species*, in malarial fever.

*Digitalis purpurea*, in diseases of the heart.

*Diosypros species*, in internal inflammations and hæmorrhages, and externally boils and tumours.

*Dipterocarpus turbinatus*, in bronchial and genito-urinary diseases, (gonorrhœa, gleet), leprosy and other skin diseases.

*Dolichos species*, in diarrhœa, leucorrhœa, hæmorrhages from internal organs, coughs, and calculus affections.

*Draksharishta*, in constipation and consumption.

*Dryopteris felix*, for expulsion of tape worms.

*Echinops echinatus*, in impotence, dyspepsia, hysteria, syphilis and scrofula.

*Eclipta erecta*, in hepatic disorders, asthma, hiccough, splenic enlargements, cephalalgia, elephantiasis, poisonous wounds, and internally uterine hæmorrhages.

*Elephas indicas, etc.*, in jaundice and sterility of women and externally leucorrhœa and conjunctivitis.

*Elettaria cardamomum*, in stomach complaints, biliousness and vomiting.

*Embelia ribes, etc.*, in intestinal worms, tape-worms, gastric disorders, piles and locally toothache, headache, indolent ulcers, and other skin diseases and in lung inflammation.

*Emblica officinalis*, in worms, acidity, inflammations of the lungs, and eyes, ulcerations, gastro-intestinal disorders,

and discharges, painful micturition, and internal hæmorrhages.

*Entada pursœtha, (See also:—E. scandens)*, used as an emetic and in uterine disorders, and as poison to fish.

*Ephedra pachuclada, (See:—Ephedra vulgaris),* is an excellent cardiac stimulant and relieves asthma.

*Erigeron canadansis or canadense*, in kidney diseases, diarrhœa, gravel, and as tonic.

*Eriodendron aneractuosum,* in gonorrhœa, dysentery, hæmorrhoids, menorrhagia, impotence and diabetes.

*Erythrina indica,* in intestinal worms, dysentery, dysmenorrhœa, strangury, spyhilis, and locally in opthalmia, toothache, rheumatism, etc.

*Erythroxylon coca,* in general debility, catarrh, cold, asthma, etc., and as local anæsthetic.

*Eualyptus globulus,* in respiratory affections, diphtheria, fevers, purulent catarrhal affections of the bladder, urethra and vagina, chronic bowel complaints, and locally wounds, fœtid ulcers, chronic skin diseases, and spongy bleeding gums.

*Engenia caryophyllata,* in flatulency and indigestion.

*Eugenia jambolana,* in leucorrhœa, cholera, enlarged spleen, colic, acne, diabetes, chronic diarrhœa and dysentery.

*Eupatorium ayapana,* in ague, gastro-intestinal derangement, hæmaturia, hæmoptysis, and locally to bleeding piles, ulcers, and venomous bites.

*Eupatorium perfoliatum,* for fever, catarrh, asthma, etc.

*Euphorbia species, (Euphorbia antiquorum* in rheumatism; *E. neriifolia,* in warts and earache), in dropsy, palsy, syphilis, leprosy, enlarged liver and spleen, spasmodic respiratory complaints, and externally to neuralgias, glandular swellings, painful joints, rheumatism, whitlows, warts, earache, scrofulous and other inveterate ulcers, venomous bites, and syphilitic nodes.

*Euphorbia pilulifera,* in bowel & lung complaints of children, asthma, dysentery, gonorrhœa, spasmodic dyspnœa and coryza.

*Euphrasia officinalis,* useful for weak eyes, ophthalmia, etc.

*Fagonia Arabia, etc.*, in sore mouth, stomatitis, renal colic, gravel, inflammations, intense scratching and skin irritability.

*Fel Bovis Purificatum*, in measles, small-pox, heat in the body, whooping cough, diarrhœa, and other intestinal disorders, hysteria, convulsions, spasmodic diseases, jaundice, deficient secretion of bile, abortion and externally skin diseases.

*Feronia elephantum*, in diarrhœa, dysentery, biliousness, dyspepsia, scurvy, affections of the gums and throat.

*Ferrum and its salts*, in diabetes, anæmia, chlorosis, dropsy, hæmorrhagic diseases, leucorrhœa, chronic dyspepsia, scrofula, tuberculosis, intestinal worms, and blood parasites, erysipelas, carbuncles, farunculosis, enlarged spleen and liver, diabetes, and other urinary diseases, ascites, anasarca, uterine troubles, chronic bowel complaints, general and sexual debility, neuralgia, rheumatism, and externally foul syphilitic ulcers, and various skin diseases, fistulae, bleeding piles, ozoena, rectal prolapsus, and eye diseases, alopecia, and grey hairs.

*Ferrum preparations,* in anaemia, debility, bleeding piles, and prolapse of anus, and as laxative tonics.

*Ferula asafoetida,* etc., in dyspepsia, flatulence, diarrhoea, cholera, diabetes, colic, convulsions of weak children, nervousness, hysteria, spasmodic and obstinate coughs, worms, liver torpidity, uterine affections, habitual abortions, nervous paralytic and rheumatic complaints.

*Ficus Bengalensis, etc.*, in diabetes, hæmoptysis, gonorrhœa, spermatorrhœa, dysentery, diarrhoea, and locally toothache, bruises, cracks, and rheumatic pains.

*Ficus Benjamina,* in cough, indigestion, dropsy and insomnia.

*Ficus carica,* in constipation, renal and vesical calculi, vesceral obstructions, piles, gout, and externally ulcers, gum boils, cracks in the mouth, etc.

*Ficus glomerata,* in dysentery, menorrhagia, consumption, diabetes, bilious affections, and locally aphthæ, ulcers even leprous, scrofulous, and cancerous.

*Ficus indica,* in cholera.

*Ficus religiosa*, in gonorrhœa, leucorrhœa, skin diseases, cracked feet, and anal fistula, aphthous sores, and internally dysentery and as nutricious cooling drink in heat of body.

*Fœniculam vulgare,* in headaches, flatulence, colic, diarrhœa, dysentery of children, indigestions, painful micturition, suppression in menses, and general heat of the body, jaundice, hæmoptysis and epistaxis.

*Fraxinus excelsior,* is laxative and purgative, in intermittent fevers, ague, etc., and in gout and rheumatoid arthritis.

*Fraxinus ornus,* is a laxative; also a strengthening food; very useful for sick children.

*Fucus vesiculosus,* is most effective for obesity, and used for kidney trouble.

*Fumaria officinalis,* for stomach, liver derangements, and skin affections.

*Galium aparine* is excellent for gravel and other urinary disorders; also a tonic.

*Gallus bankiva var domesticus,* in invalid and anæmic conditions, convalescence, emaciation, general debility, and locally buboes, boils, cancer, etc.

Garcinia mangostana, in chronic diarrhœa and dysentery, leucorrhœa gonorrhœa, gleet, and locally tonsilitis, prolapsus. ani and vaginæ.

*Garcinia pictoria,* etc., in hepatic obstructions, gouty arthritis, apoplexy and cerebral congestion and locally sprains, bruises and swollen hands and feet.

*Garcinia purpurea,* in dysentery, mucous diarrhœa, pulmonary phthisis and scorbutic diseases, and locally burns and scalds, fissures and ulcerations.

*Gardenia gummifera,* in toothache, worms, malarial fevers, skin diseases, colic, foul sores, and maggots in the nose.

*Gasterpoda and its preparations,* in dysentery, gonorrhœa, colic, dyspepsia, jaundice, tympanites, flatulence, catarrh, cough, asthma, discharges from ears, nose, etc.

*Gaultheria fragantissima,* in rheumatism, fibrostis, lumbago, and sciatica.

*Gendarussa vulgaris,* in fevers coughs and colic of children, chronic indigestion and dysentery, and locally glandular swellings and rheumatic joints.

*Gentiana kurroo,* in general debility, convalescence after fevers, dyspepsia, gout, torpid liver, spleen enlargement, anæmia, and worms.

*Geum urbanum,* is an excellent restorative in weakness, debility, etc.

*Ghee,* in cancer.

*Glycyrrhiza glabra,* in sore throats, colds, hoarseness, catarrhs, coughs, bronchial affections, bilious fevers, influenza, leucorrhœa, and other uterine complaints.

*Gmelia arborea,* in fevers, indigestion, waterbrash, anasarca, and locally headache.

*Gossypium indicum,* in dysentery, piles, strangury, gravel, uterine disorders, and as antidote to datura poisoning and externally to sores, boils, wounds and gouty joints.

*Gratiola monniera,* (see also:—*Herpestis monniera,)* as a nervine tonic in insanity and epilepsy.

*Gymnema sylvestre,* in snake bites, swollen glands, and visceral enlargements, and internally in cough, diabetes and fever.

*Gynandropsis pentaphylla,* in sprains, round worms, convulsive affections and locally otitis, otalgia, boils and other external inflammations.

*Gynocardia odorota,* in leprosy, scrofula, and other skin diseases, chronic rheumatism, gout and secondary syphilis.

*Helicteres isora,* in intestinal complaints, (colic, flatulence, diarrhœa, and dysentery), diabetes and locally in otorrhœa.

*Heliotropium indicum,* in boils and scorpion stings.

*Helleborus niger,* in chronic fever, apoplexy, dropsy, mania, hiccough, jaundice, melancholia, and worms.

*Hemidermus indicus,* in chronic cough, syphilitic cachexia, leucorrhœa, gravel, strangury, dyspeptic and nutritional disorders, genito-urinary diseases, chronic rheumatism and impurity of the blood, debility and skin affections.

*Hermodactylus gol,* in intermittent fever, bronchial catarrh, and congestion, hysteria, dysentery, chronic gout, torpid liver, dropsy and enlarged spleen.

*Herpestis monniera,* in insanity, hysteria, epilepsy, and bilious disorders, anurea and obstinate costiveness, remittent fever.

*Hibiscus species,* in fevers, hysteria, gonorrhœa, urethritis, catarrhs of the bladder and air passages, seminal weakness, and externally bruises, sprains, insect bites, inflamed joints, and skin diseases.

*Hirudo medicinalis,* in acute inflammation of the glands and of the serous membranes and of the skin or bones, (but not in the affections of the scrotum or eye-lids), obstinate vomiting, violent headache, severe pains in the chest or the abdomen, menstrual deficiency, acute dysentery and congestion of the liver.

*Holarrhena antidysenterica* in amœbic dysentery and diarrhœa, piles, intestinal worms chronic chest affections, dyspepsia and externally rheumatism and toothache.

*Hordeum vulgare etc.*, as a diluent drink in fevers, nutritious food for infants and a demulcent in the irritation of the bladder kidney, urethra, etc.

*Humulus lupulus,* is a valuable tonic for stomach and nerves; also for indigestion and worms.

*Hydnocarpus species,* in leprosy, phthisis, abscesses, sore-eyes, and wounds, scrofulous nodes, skin diseases, syphilitic or otherwise, gonorrhœa, vaginal foetid discharges, internally as well as externally.

*Hydrargyrum and its preparations,* in fevers, diarrhœa, dysentery, anasarca, dyspepsia, hyperacidity, chronic gastritis, worms, jaundice, dropsy, liver diseases, bronchial affections, nervous diseases, diseases of the female and urinary organs, mental and physical debility, uric acid diathesis, gravel; syphilis, gonorrhœa, paralytic troubles, rheumatism, and externally syphilitic eruptions, skin diseases, inflamation of lymphatic glands, buboes, etc., tonsilitis, boils and ophthalmia.

*Hydrastis canadensis,* an excellent tonic and a splendid specific for liver and digestive complaints.

*Hydrocotyle asiatica,* in leprous, scrofulous, syphilitic and other skin affections, tetanus, tetanic convulsions, epilepsy, chronic rheumatism, elephantiasis, dysenteric and other bowel complaints, various sorts of fevers, including remittent; insanity, and hypochondriasis, and as a nervine tonic.

*Hygrophila spinosa, etc.*, in rheumatism, gravel, gonorrhœa leucorrhœa, and other genito-urinary diseases, dropsy, hepatic obstructions, impotence, and diarrhœa.

*Hyoscyamus niger, etc.*, in mental and nervous irritabilities, spasmodic and irritable affections of the lungs, bowels and genito-urinary organs, (cystitis, prostatis, calculus,) gouty and other inflammatory swellings.

*Hypericum perforatum,* in coughs, colds, bronchitis, and lung diseases.

*Hyssopus officinalis,* for coughs, colds and lung complaints.

*Ichnocarpus frutescens,* in chronic skin diseases, syphilis, elephantiasis, and loss of sensation.

*Indigofera species,* in elephantiasis, leprosy, cancer, secondary syphilis, calculus affections, nervous affections, enlarged liver and spleen, kidney complaints and locally in aphthæ, various skin affections, hæmorrhoids, wounds, ulcers, venomous bites, burns and scalds.

*Ipomœa species,* to promote the growth of the fœtus in utero, and in spleen and liver enlargements, gout, rheumatism,

gonorrhœa, and dropsies, colic, constipation and torpidity of bowels, emaciation and general debility, feverish attack, neuralgia, headache, melancholia, cutaneous diseases, paralysis, and locally ulcers, rat, scorpion and snake bites.

*Iris florentina,* used in tooth pastes, powders, etc., for fragrance.

*Iris germanica,* in skin diseases.

*Iris pseudocorus,* in scanty urine and anuria.

*Ixora coccinea, etc.,* in diarrhœa, dysentery, gonorrhœa, leucorrhœa, and locally ulcers, boils, headaches, and sore throats.

*Jasminum species,* in insanity, hysteria, amenorrhœa, bronchial obstructions and externally in obstinate skin diseases, headaches, ear and nose diseases, ulcers in the mouth, mammary abscesses and eye complaints.

*Jateorhiza calumba,* in dyspepsia, weakness of stomach, etc.

*Jatropha species* in enlargement of spleen and liver, glandular swellings, constipation and flatulence, and externally boils, itches, herpes, eczema, and abscesses, hæmorrhages, spongy gums, obstinate skin diseases, rheumatic joints, sinuses and paralysis.

*Jonesia asoka,* (See:—*Saraca indica*), in female diseases.

*Juniperus communis,* in scanty urine, chronic Bright's disease, hepatic dropsy, pectoral affections, chronic gonorrhœa, and leucorrhœa, and locally rheumatic swellings, and certain skin affections.

*Justica adhatoda, See:—Adhatoda vasica.*

*Kaolinum,* in cholera, dysentery, diarrhœa, gastritis, gastric and duodenal ulcer and hyperacidity, and locally diphtheria, burns, vaginal and uterine discharges, neurosis of the heart, hysteria, gonorrhœal epididymitis and dandruff.

*Kumyss,* in diabetes, irritability of the stomach and obstinate vomiting.

*Lacerta agilis preparation,* in general debility and impotence.

*Lactus and its preparations,* in gastric catarrh, ulcers and cancer, gastrorrhagia, dyspnœa, hectic cough, chronic diarrhœa, and other intestinal disorders, flatulence, piles, worms, albuminuria and urinary complaints, anorexia, ascites, and anasarca, splenitis, stomatitis, acid stomach, heart-burn, appendicitis, jaundice, insomnia, poisoning by corrosive sublimates, copper sulphate and corrosive acids, enteric and

other low fevers, eye-diseases, and externally syphilis, acute iritis, hereditary eczema, colic, sores, burns, blistered surfaces, wasting diseases, irritability of the skin, coryza, nervous diseases, rheumatic affections of joints, eye-affections, burning of the body, hands and feet, and chest pains.

*Lauha, or Loha, or Mandura bhasma,* in nervous anæmia, diarrhœa, and dyspepsia, and as a blood purifier.

*Lawsonia alba, etc.,* in headache, diarrhœa, dysentery, jaundice, hepatitis, splenitis, calculus affections, menorrhagia, vaginal discharges, leprosy and other depraved conditions of the body and locally bruises, sprains, inflammations, burns, gonorrhœa, leucorrhœa and small-pox.

*Lens esculanta,* in debility, mal-nutrition, and externally small-pox and other foul ulcers.

*Lepidium sativum,* in constitutional diseases like scrofula, syphilis, rheumatism, diarrhœa, dysentery, hiccough, and skin diseases, chronic enlargement of the spleen, etc., seminal debility, leucorrhœa, scurvy and externally in skin diseases, sprains, bruises, dislocation and rheumatic pains.

*Linum usitatissimum,* in bronchial affections, irritation of the genital and urinary organs, spasmodic affections of the bowels, piles, and externally as poultice in ulcerated and inflamed surfaces, deep-seated inflammations, burns and scalds.

*Lobelia nicotianifolia,* in asthma and bronchial affections.

*Luffa species,* in ascites, enlarged spleen, infantile cirrhosis of the liver, piles, jaundice, worms, colic. dysentery, dropsy, and externally in headache, jaundice, carbuncles, and other foul ulcers, splenitis, hæmorrhoids and leprosy.

*Makaradhwaja* in indigestion, fever, nervous debility, and as an intestinal antiseptic.

*Mallotus philippinensis,* in tape-worm and ringworm.

*Malva sylvestris,* in coughs and colds.

*Mangifera indica, etc.,* in throat diseases, diarrhœa, chronic dysentery, bleeding piles, round-worms, leucorrhœa, menorrhagia, acute gonorrhœa, scurvy, hæmatemesis, aphonia, diabetes, and externally in parasitic skin diseases, bruises, and cracks in the feet, etc.

*Marrubium vulgare,* for colds, coughs and as a tonic.

*Matricaria chamomilla*—See:—Anthemis nobilis.

*Mel and its preparations,* in bronchial affections, chronic colds, pneumonia, heart-weakness, rickets, marasmus, scurvy, infirmity of old age, menorrhagia, piles, diabetes and locally

aphthæ, thrush, sore nipples, headache, colic, bruises, sprains, burns, scalds, ulcers, inflamed glands.

*Melanleuca leucadendron,* in flatulence, colic, diarrhœa, hysteria, hiccup, dyspnœa, dysmenorrhœa, neuralgia, rheumatism, and low fevers, and externally rheumatic, muscular and neuralgic pains, earaches, and skin affections.

*Melia azadirachta,* in intermittent fevers, (periodic— ague, malaria) convalescence, atonic dyspepsia, rheumatic complaints, syphilis, intestinal worms, piles, urinary diseases, uterine flux, jaundice, catarrhal affections, and chronic skin diseases, (leprosy) and externally in cases of small-pox, rheumatism, foul and indolent ulcers, parasitic skin affections, (erysipelas) scrofulous and glandular swellings, bruises, and sprains.

*Melia azadirach,* in leprosy, scrofula, intestinal worms, splenic enlargement, and locally nervous headaches and eruptive skin diseases.

*Mentha arvensis* in diarrhœa and dyspepsia.

*Mentha piperita, etc.,* in colic, vomiting, flatulence, and other gastric disturbances, dysmenorrhœa, hiccup, palpitation of the heart, as cordial for infants, and locally diphtheria, toothache, neuralgic and rheumatic pains.

*Mentha viridis,* as a stimulant to allay sickness and to relieve flatulency.

*Menyanthes trifoliata,* is a good tonic, useful for liver trouble, scurvy and other skin diseases.

*Mesua ferrea, etc.,* in bleeding piles, dyspepsia, dysentery, and locally severe colds and skin affections.

*Mica and its preparations,* in anæmia, chlorosis, jaundice, biliousness, chronic diarrhœa, dyspepsia, dysentery, nervous debility, impotence, chronic fever, hectic fever, phthisis, enlarged spleen, urinary diseases, anasarca, scurvy, cachectic conditions, asthma, intestinal worms, chronic bronchitis, colic, gonorrhœa, spermatorrhœa, rheumatism, piles, heart-diseases, paralysis, leprosy, diabetes, and eye-diseases.

*Michelia champaca, etc.,* in flatulence, dyspepsia, chronic gastritis, colic, gonorrhœa, and renal diseases, and locally abscesses, gout, rheumatism, cephalalgia, and fœtid discharges from the nostrils.

*Mimosa species,* in calculus complaints, piles and fistula, diseases arising from corrupt blood and bile, and externally fistulous sores, hydrocele and glandular swellings, eye-inflammations, white leprosy, skin eruptions, boils and burns.

*Mimusops elangi, hexandra, etc.*, to increase fertility in women, in painful micturition, stone in the bladder, and in fevers, as nutritive tonic, and externally wounds and ulcers, headache, obstinate constipation, loose teeth, spongy gums, salivation, mucous discharge from the nose, bladder and urethra.

*Momordica species*, in bilious affections, piles, jaundice, worms, leprosy, dysmenorrhoea, and externally intractable ulcers, and other skin affections; burning in the feet, night blindness, liver complaints of children; headache and inflammation caused by contact with the urine of the house-lizard.

*Moringa oleifera*, in intermittent fever, epilepsy, chronic rheumatism, dropsy and dyspepsia.

*Moringa pterygosperma, etc.*, in ascites, gout, calculi, rheumatism, enlarged liver or spleen dropsy, intermittent fevers, influenzal coughs, spasmodic affections of the throat, bronchi and the bowels epileptic and hysterical fits, and externally in fainting fits, comatose conditions, glandular swellings, headache, earache, toothache, bites of rabid animals, inflamed parts to relieve spasms and to expedite delivery.

*Moschus Moschiferus and its preparations*, in hoarseness, chronic cough, typhoid conditions, low and adynamic fevers, delirium tremens, coma, meningitis, brain affections, tetanus, epilepsy, hysteria, colic, spasmodic affections, palpitation of the heart, colliquative sweats, mental and bodily fatigue, insomnia, metastic gout, lung affections, dyspepsia and to increase manly vigour.

*Mucuna pruriens, etc.*, in dropsy, dyspepsia, worms, colic, leucorrhœa, spermatorrhœa, impotence, nervous diseases and externally for elephantiasis and scorpion stings.

*Musa sapientum, etc.*, in sprue, catarrhal and inflammatory diarrhœa, dysentery, dropsy, piles, scanty micturition, scurvy, acidity, heartburn, gastritis, flatulence, gonorrhœa, intoxication of drunkards, dysmenorrhœa, menorrhagia, strumous affections and externally hæmorrhages, and as eye-shade in eye-diseases.

*Syrup banana*, in bronchitis.

*Mussœnda frondosa*, in collapse, fainting, and enlarged glands, ulcers, etc.

*Myrica sapida, etc.*, in throat and lung affections, phthisical diarrhœa, chronic gonorrhœa, and gleet and externally scrofulous and aphthous ulcers, earache, nasal catarrh, and headache, toothache, and piles.

*Myristica fragrans, etc.*, in summer diarrhœa, cholera, humeral asthma, colic, neuralgia, spasmodic cough, obstructions of the liver and spleen and externally chronic rheumatism, sprains, paralysis and painful cramps in cholera.

*Myristica malabarica,* in nervous diseases and externally chronic rheumatism, earache and indolent ulcers.

*Myrtus caryophyllus,* in dyspepsia, indigestion, asthma, mucous diarrhœa, debility and externally rheumatic pains, headaches, toothaches and coryza.

*Myrtus communis,* in affections of the respiratory organs and the bladder, diarrhœa, dysentery and externally rheumatic affections, hæmorrhages, fœtid ulcerations, deep sinuses, skin diseases, leucorrhœa, prolapsus of the uterus, wounds and baldness.

*Mytilus margaritiferus and preparations,* in impotency, cough, phthisis, asthma, heart-burn, ardor urinæ, nervous diseases, chronic headache, epilepsy and other convulsive attacks, piles, gonorrhœa, gleet, leucorrhœa, spermatorrhoea, heart disease, dyspepsia, jaundice, biliousness, diabetes, general debility, urinary diseases, and to prevent abortion.

*Nardostachys jatamansi,* in typhoid symptoms, epilepsy, hysteria, and other nervous, convulsive ailments, palpitation of the heart, gastric disorders, general and seminal debility.

*Nelumbium speciosum,* in coughs, heart diseases, phthisis, diarrhœa, menorrhagia, chronic fevers, bleeding piles and other hæmorrhagic affections, externally leprosy and other skin affections, cephalalgia, and to cool the head and eyes.

*Nerium odorum, etc.,* in menstrual and renal complaints, and externally hæmorrhoids, cancers, ulcerations, and other skin complaints, snake and other venomous bites, and in ophthalmia.

*Nicotiana tabacum, etc.*, for external use in rheumatic affections, spasmodic coughs, nervous irritability, chronic giddiness, and fainting, colic and gripes, and to the spine in tetanus.

*Nigella sativa, etc.,* in intermittent fevers, diarrhœa, loss of appetite, worms, dropsy, puerperal and uterine diseases, locally in aphonia, skin diseases, swellings in hands and feet, and to preserve clothes from the ravages of insects.

*Nyctanthes arbortristis,* in chronic bilious, malarial and intermittent fevers, colds, rheumatism, sciatica, and externally to cure scurvy and affections of the scalp, etc.

*Nymphœa species,* in heat of the body, diabetes, piles, dyspepsia, diarrhœa, internal hæmorrhages, and externally in

ophthalmia, and as lotion for bad legs and ulcers, and in putrid sore-throat as a gargle.

*Ochrocarpus longifolius,* in dysentery, irritability of the stomach, excessive sweating and externally toothache.

*Ocimum species,* in colds, catarrhal fevers, respiratory affections (asthma), dysentery, gastric, genito-urinary and renal diseases, hepatic affections and externally earache, rheumatism, nasal myosis, ozœna, swollen hands or feet and skin diseases.

*Oldenlandia herbacea,* in malarial fevers.

*Onosma echioides,* for cutaneous eruptions, as cardiac tonic in rheumatism and diseases of the heart.

*Ophelia chirata,* (See:—*Swertia chirata*), in fevers and liver ailments.

*Ophiorrhiza mungos,* in bites of snakes and mad dogs.

*Orchis mascula,* in phthisis, diabetes, chronic diarrhœa, and dysentery, impotency, hemiplegia, paralytic affections.

*Origanum vulgare,* for female complaints, colds, fevers and to promote perspiration.

*Oryza sativa,* in irritable and inflammatory state of the stomach, bowels or kidneys, dyspepsia, gastric and duodenal ulcers, eruptive fevers and externally inflammatory affections of the skin, burns and scalds, wounds and ulcers.

*Os sepie and its preparations,* in itches, prickly heat and other skin diseases, otorrhœa and conjunctivitis.

*Osterea edulis and its preparations,* in diarrhœa, dyspepsia, and chronic intestinal disorders, phthisis, abdominal tumours, enlarged liver and spleen, loss of appetite and seminal weakness.

*Oxalis corniculata,* in dyspepsia, datura poisoning, dysentery, enteritis, prolapsus of the rectum, piles, difficult micturition, and externally in bilious headaches, and to remove corns warts and other skin excrescences.

*Pœderia, fœtida,* in colic, spasm, rheumatism, gout and externally in rheumatism with contraction and stiffness of the joints, and in toothache.

*Pœonia emodi,* in colic, uterine disorders, epilepsy, bilious obstructions, diarrhœa, and externally bruises, sprains, etc.

*Pandanus odoratissimus,* in sterility and threatened abortion, and externally headaches, rheumatism, earache, epilepsy, and throat affections.

*Papaver somniferum*, in diarrhœa, dysentery, diabetes, coughs, bronchitis, asthma, irritable heart and angina, rheumatism, tumours, cancer, carbuncle, abscesses and ulcers, insomnia, colic visceral obstructions, intestinal and genito-urinary irritations and spasmodic inflammatory pains, nervous weakness and exhaustion, neuralgia, mental excitement, violent delirium, and externally sprains, contusions, spasms, uterine affections, irritable ulcers, toothache, earache, ophthalmia, chronic rheumatism, enlarged and inflamed glands, painful piles, and pains of various sorts.

*Parmelia perlata*, in dysentery, diarrhœa, dyspepsia, spermatorrhœa, and amenorrhœa.

*Pavetta indica*, in ascites, renal dropsy, visceral obstructions and externally painful piles.

*Pavonia odorata*, in internal hæmorrhages and inflammations.

*Pedalium murex*, in calculi, urinary irritations, impotency, uterine and puerperal diseases, and locally ulcers.

*Peganum harmala*, in asthma, colic, jaundice, amenorrhœa, tape worms, intermittent and remittent fevers, including malaria, and locally palsy and lumbago.

*Pericampylus incanus*, in snake bites.

*Periploca aphylla*, in cerebral fever.

*Peteroselinum sativum*, in uterine and renal diseases, epileptic fits, and externally sore eyes and breasts.

*Peterospermum species*, in uterine diseases, leprosy, blood diseases and externally nervous headache.

*Peucedanum species*, in flatulency, gastric and intestinal disorders, and externally rheumatic joints, boils and abscesses.

*Phaseolus species*, in gastro-intestinal catarrh, or inflammation, piles, paralysis, cystitis, rheumatism, liver and nervous affections, leucorrhœa and seminal debility, and externally aching bones and joints, abscesses, inflammations, ophthalmia, and neuralgias.

*Phoenix species*, in general debility, ague, bronchial and genito-urinary affections, and externally headaches, piles, ophthalmia and corneal opacity.

*Phyllanthus species*, in jaundice, genito-urinary diseases, dysentery, diabetes, and externally ulcers and inflammations, spongy and bleeding gums, uvulitis and tonsilitis.

*Physalis species*, in diarrhœa, dysentery, anæmia, gout, rheumatism, nephritis and urinary diseases.

*Picrorrhiza Kurroa*, in intestinal obstructions, dyspepsia, and neurosis of the stomach and bowels, worms, elephantoid, bilious and malarial fevers.

*Pimpinella anisum*, in bronchial and gastro-intestinal complaints and locally headache and flatulent colic.

*Pinus species*, in bronchial affections, chronic rheumatism, skin diseases, flybites, sciatica, gout, cholera, dysentery, used as an astringent injection in certain female complaints, leucorrhœa, gleet, urethritis, seminal debility, gleet and gonorrhœa, externally indolent ulcers, abscesses, enlarged liver, flatulency, colic spasm, convulsions, parasites, lice tympanites, and painful chest.

*Piper cubeba*, in leucorrhœa, bronchitis, and laryngitis.

*Piper nigrum*, in cough, stomach-ache, worms, malaria and piles.

*Piper species*, in couh and catarrh, inflammations of the nose, throat, larynx and bronchi, constipation, worms, colic, tympanites, dyspepsia, diarrhœa, gastritis, and renal diseases, acute and chronic gonorrhœa, gleet, and cystitis, visceral enlargements and externally boils, piles, paralysis, toothache, earache and painful eye affections.

*Pistacia species*, (See also:—*Rhus succedanea*), in gonorrhœa, leucorrhœa, impotency, phthisis, sluggish liver, catarrhs of the respiratory and urinary passages, and externally dental caries, toothache, sore mouth and tongue.

*Plantago ispagula; P. ovata, etc.*, in irritable and inflammatory conditions of the respiratory, gastro-intestinal, and genito-urinary organs, intestinal ulceration, (acute and chronic dysentery), piles, and externally rheumatic and gouty affections, swellings and irritable surface of the skin.

*Plantago major*, for insect bites, diarrhœa, piles, and in blood impurities.

*Plantago ovata*, in chronic dysentery, cystitis, gonorrhœa, and functional derangements of the digestive system.

*Plantago species*, in secondary syphilis, skin diseases, leprosy, piles, liver and spleen enlargements, gastric and digestive complaints, abortion, post-partum haemorrhage, (uterine ailments), rheumatic complaints, and externally in skin diseases, enlarged glands, rheumatic and paralytic affections.

*Plumbago zeylanica*, increases digestive powers, useful in dyspepsia, piles, anasarca, diarrhœa and skin diseases; applied to abscesses.

*Plumbum and its salts,* in chronic diarrhœa, and discharges from gastro-intestinal and genito-urinary organs, night sweats of phthisis, epilepsy, aneurysm of the aorta, and hypertrophy of the heart, and externally excoriations, contusions, sprains, baldness, itching, skin diseases, small-pox, piles and eye complaints.

*Podophyllum emodi and P. hexandrum,* in torpid liver bilious fevers.

*Podophyllum peltatum,* a powerful medicine, exercising an influence on every part of the body. Small doses frequently given are the best; excellent for scrofulous and dyspeptic complaints.

*Pogostemon patchouli,* in scanty urine and in biliousness.

*Polyporus officinalis,* in night sweats of phthisis, spasmodic cough and externally inflamed breasts and leech bites.

*Pongamia glabra, P. pinnata, etc.,* in flatulency, dyspepsia, diarrhœa, bleeding piles, gonorrhœa, urethritis, diabetes, bronchitis, whooping cough and externally skin diseases, (scabies, herpes and foul ulcers, psoriasis and pityriasis), rheumatism, lymphatic glands, fistula in ano, and leprosy.
bladder and bowels, scurvy and externally erysipelas, burns, scalds and various skin diseases.

*Portulaca species,* in diseases of the lungs, liver, kidneys, bladder and bowels, scurvy and externally erysipelas, burns, scalds and various skin diseases.

*Potassi nitras,* in cough, externally on painful joints and asthmatic fits.

*Potassium carbonas impura,* in dropsy, erythema of skin, and typhoid fever.

*Potassium salts,* in urinary diseases, gonorrhœa, uric acid diathesis, uterine irritability, haemorrhages from internal organs, enlarged lymphatic and secreting glands, enlarged spleen, cirrhosis of the liver, with ascites, dropsy, asthma, and bronchial affections, piles, dysentery, colic, intestinal worms, and locally chronic skin diseases, gout and rheumatism, eruptive fevers, bruises and abrasions, headache and delirium.

*Prunus amygdalus, etc.,* in bronchial diseases, earache, painful urinary and kidney affections, diabetes, torpid and enlarged liver and spleen, piles, gonorrhœa, and externally neuralgias, irritable sores and skin eruptions.

*Psidium guyava, etc.,* in constipation, gout, diabetes, prolapsus ani, scurvy and locally swollen gums.

*Psoralea corylifolia*, in leucoderma, leprosy and skin diseases.

*Pterocarpus marsupium*, in diarrhœa, pyrosis etc., and locally toothache, boils, sores and other skin diseases.

*Pterocarpus species*, in bleeding piles, hæmorrhages, chronic dysentery, leucorrhœa, gastralgia and locally inflammations, piles, headaches, and superficial excoriations of the genital organs and herpes zoster.

*Ptychotis ajowan, etc.*, in flatulence, indigestion, colic, dyspepsia, diarrhœa, cholera, biliousness, hysteria, worms, spasmodic affections, dipsomania and externally rheumatic and neuralgic pains, cramps in the limbs, poisonous insect bites and diseases of the ear and nose.

*Punica granatum*, in chronic diarrhœa, dysentery and other chronic bowel complaints, tapeworms, chronic feverishness, consumption, splenic enlargement, piles and locally relaxed sore throat, vaginal and uterine discharges. and ulcers.

*Putranjiva Roxburghii*, for sterility in women.

*Pyrethrum indicum*, in rheumatism, gout, enlargement of the liver and spleen, and worms.

*Pyrus species*, in dyspepsia, gonorrhoea, dysentery, and other inflammations of the mucous membranes, calculi, gouty and rheumatic complaints, sick headaches, chronic catarrh of the mouth and throat.

*Quassia excelsa, etc.*, in dyspepsia, anorexia, bilious fevers, hysteria, worms, and locally thread worms.

*Quercus infectoria*, in diarrhoea, gonorrhoea, gleet, leucorrhoea, and other vaginal discharges, (menorrhagia) and internal haemorrhages, and locally prolapsus recti, relaxed sore-throat, enlarged tonsils, haemorrhoids, etc.

*Quinetum*, in gastric disorders, intermittent fever, convalescence, and debility after fevers, enlarged spleen and neuralgias.

*Quinine*, in fevers, (intermittents and agues), pneumonia, and acute rheumatism, pyaemia and all exhausting suppurative conditions.

*Randia dumetorium*, in diarrhoea, dysentery, colic, rheumatism, asthma, bronchial and chest affections and locally headaches, orchitis, acne, etc.

*Raphanus sativus*, in gonorrhoea, piles, gastrodynia, and other gastric affections, urinary diseases and scurvy.

*Raupya bhasma,* in inflammation of mucous membrane. neuritis, and neuralgia.

*Rouwolfia, serpentina,* in bites of poisonous reptiles, and insects, corneal opacity, and internally colic, cholera and other painful bowel affections, insanity, to reduce high blood pressure, (i.e., in hyperpiesis), and insomnia.

*Rhamnus wightii,* in enlarged spleen.

*Rheum emodi,* in diarrhoea and that due to teething, atonic dyspepsia, chronic dysentery, duodenal catarrh, and jaundice; externally used on plague glands, but *prohibited* in gout, rheumatism, epilepsy or any uric acid disease, owing to the oxalic acid it contains.

*Rheum palmatum,* small dose will cure diarrhoea, large dose is a safe aperient.

*Rhinacanthus communis,* in ringworm, and Dhobie's itch.

*Rhus succedania,* (See also:—*Pistacia integerrima),* etc., in cough, asthma, enlarged glands, catarrhal fever, and bronchial troubles, infantile diarrhoea, etc., due to teething and externally obstinate skin diseases, bleeding gums, epistaxis, gleet, leucorrhœa, and other mucous discharges.

*Ribes nigrum,* for hoarseness, sore throat, coughs, and catarrh generally.

*Ricinus communis,* in inflammatory condition of the bowels and urinary organs, jaundice and enlarged spleen, infantile diarrhoea, lying-in-state, piles, painful affections of the rectum, any foreign and irritant body in the stomach, nervous and articular rheumatic affections, and locally gouty and rheumatic swellings, deficient mammary secretion, sore nipples, conjunctivitis, foreign body in eyes and ears.

*Rosa species,* in sore throat, enlarged tonsils, night sweats of phthisis, uterine and pulmonary haemorrhages, and locally throat affections, aphthae, burning of the skin, and eye-diseases.

*Rosebay,* in gout, rheumatism, neuralgia, constipation, chronic affections of the testes, and filariasis.

*Rourea santaloides,* in rheumatism, scurvy, syphilis, diabetes, pulmonary complaints, and externally ulcers, and other skin diseases.

*Rubia cordifolia,* etc., in dropsy, paralysis, jaundice, amenorrhoea, and visceral obstructions and externally inflammations, burns, ulcers and other skin diseases.

*Rumex acetosa, or R. acetosella,* in kidney complaints, fevers, and as a cooling drink as well as a salad.

*Rumex crispus, etc.*, in scurvy and other skin eruptions, syphilis, scrofula, dyspepsia, hepatic disorders, rheumatism, liver troubles, laryngeal catarrh, chronic dysentery, piles, and locally toothache, spongy gums and burns.

*Ruta graveolens*, in flatulent-colic, hysteria, female complaints, infantile convulsions, worms, bronchial and pulmonary affections and externally paralysis.

*Saccharum officinarum, etc.*, in disorders due to *pitta* and *vata*, lead colic, urinary diseases, dystenery, strangury, spermatorrhoea, and in poisoning by copper, arsenic, or corrosive sublimate, and externally foul ulcers, carbuncles, boils, burns, obstinate headache, poisonous insect bites, country sore eyes, foreign bodies in the eye, mammary abscesses, night sweats of phthisis and haematuria.

*Saline substances*, in colic, indigestion, flatulence, enlarged liver and spleen, dyspepsia, bowel complaints, abdominal tumours, intestinal worms, dysentery, etc.

*Salix alba*, in fevers of rheumatic origin, diarrhoea, and dysentery.

*Salix nigra*, in ovarian disorders, and as a poultice.

*Lalvadora species*, in low fever, amenorrhœa, scurvy, snake-bites and poisons of various sorts, enlarged spleen, rheumatism, tumours and lithiasis, and externally to strengthen teeth and gums, and to paiful tumours, piles and rheumatic jonts.

*Salvia mooracroftiana*, in bronchial affections and colds.

*Sansevieria zeylanica (See:—S. Roxburghiana)*, as a purgative, tonic and cardiac stimulant.

*Santalum album*, in gastric irritability, dysentery, gonorrhoea, gleet, urethral haemorrhage, pyelitis, chronic cystitis, etc., bronchial catarrh, and externally scabies, and other skin diseases, and eruptions, prickly heat, profuse sweating, pimples on the nose, headaches and fevers.

*Santalum rubrum*, (decoction), in leucorrhoea.

*Sapindas trifoliatus, etc.*, in colic, worms, venomous bites, hemicrania, hysteria, epilepsy, gout, rheumatism, paralysis, and externally poisonous insect bites, amenorrhoea, and difficult and delayed labour.

*Saraca indica*, in uterine affections especially in menorrhagia, and haemorrhages, bleeding piles, and dysentery.

*Saussurea lappa*, etc., in cough, bronchial asthma, dyspepsia, cholera, chronic rheumatism, and externally skin

diseases, tumours, cephalalgia, diseased joints, wounds and ulcers.

*Saxifraga ligulata*, in diarrhoea, cough, gravel and stone in bladder, uric acid diathesis, opium poisoning, and externally in teething among children, boils and eye-affections.

*Scilla Indica*, in cough, strangury, dysuria and dropsy.

*Scindapsus officinalis*, in diarrhoea, asthma and phlegmatic affections.

*Semecarpus anacardium*, in scrofulous affections, syphilis, leprosy, palsy, paraplegia, epilepsy and other nervous diseases, dsypepsia, asthma, bronchitis, anaemia, some fevers, enlarged spleen, piles, acute arthritis, rheumatic and gouty complaints, chronic gastritis, neuritis, chronic arsenical poisoning, dysmenorrhoea, amenorrhoea, and externally scrofulous, veneral and leprous affections, enlarged glands, warts and piles.

*Serpent poison preparations*, in collapse stage of fever, cholera, ascites, plague, low fevers with brain complications and cardiac and respiratory weakness, chronic malarial fevers, and externally leucoderma.

*Sesamum indicum etc.*, in gonorrhoea, dysentery, bleeding piles, amenorrhœa, dysmenorrhœa, and externally burns, scalds, wounds, ulcers and other skin diseases and eye-complaints.

*Sesbania species*, in diarrhoea, menorrhagia, enlarged spleen, smallpox, eruptive fevers, worms, and externally inflammatory rheumatic swellings, hydrocele, boils, abscesses, and cutaneous eruptions.

*Sevum preparatum*, in excoriations, cracks, fissures, etc.

*Shilajatu*" or "*Shilajit*" increases flow of digestive secretion and helps absorption, in diabetes. sexual weakness, gonorrhoea and gleet, chronic bronchitis, phthisis, asthma, nervous diseases.

*Shorea robusta*, in dysentery, diarrhoea, bleeding piles, gonorrhoea, and externally lumbago, chilblains, ulcers and other skin diseases.

*Sida acuta etc.*, in febrile affections, convalescence, dyspepsia, chronic bowel complaints, intestinal worms, rheumatic affections, gonorrhoea and externally boils and abscesses.

*Sida cordifolia*, as cardiac and nervine tonic, in bleeding piles, colic, tenesmus, gonorrhoea, haematuria, strangury, spermatorrhoea, leucorrhoea, cystitis, chronic dysentery, nervous diseases, and externally elephantiasis, nervous and rheumatic affections, ophthalmia and boils.

*Sida rhombifolia, etc.*, in rheumatism, calculus troubles, gonorrhoea, gleet, and scalding urine.

*Siegesbeckia orientalis, etc.*, in ague, rheumatism, renal colic, scrofulous and syphilitic affections, diseases of the urethra, and externally ringworm and other parasitic eruptions and gangrenous sores.

*Silicate of magnesia,* in diarrhoea and to heal wounds.

*Silicium salts,* in dysentery, ardor urinae, anuria, internal haemorrhages, gonorrhoea, calculus affections, obstinate vomiting, diarrhoea, menstrual disorders, and locally burns and scalds, syphilitic ulcers, chronic skin diseases, aphthae, epistaxis and inflamed glands.

*Sinapis juncea,* in drunkenness, narcotic and other poisonings, and externally in apoplexy, convulsions, delirium, violent headache, sleeplessness, cholera, colic, spasms of the bowels, vomiting, retching coughs, difficult breathing, whooping cough, toothache, faceache, and other neuralgic pains and chest affections.

*Smilax china, chinensis, etc.*, in rheumatism. gout, epilepsy, scrofula, chronic nervous diseases, seminal weakness and syphilitic cachexia.

*Smilax ornata,* as general purifier for the blood.

*Soda carbonas impura,* in distention of stomach and colic.

*Sodii Biboras, or Sodium Biborate,* in thrush, sore nipples, inflamed piles, pruritis of genitals, parasitic ulcers, irregular menses, uterine inertia, tedious labour, dyspepsia and liver complaints.

*Sodium chloridum,* in cholera, chronic rheumatism, sciatica, joint diseases, liquifies sputum in children; externally to wasp stings, to rdestroy lice in hair, jaundice, to blacken hair, and to reduce inflammation.

*Sodium salts and preparations,* in acidity of the stomach, cholera, painful dyspepsia, diarrhoea, flatulence, anorexia, congested liver, urinary diseases, uric acid gravel, anuria, Bright's disease, typhoid fever, malarial fever, influenza, rheumatism, gout, ascites, menstrual irregularity, and puerperal convulsions, spasmodic and phlegmatic complaints, epilepsy, heart-disease, hysteria, intestinal worms, and externally in skin diseases and sloughing ulcers, sore nipples, fissures, inflamed piles, distressing irritation of the genital organs, vaginal discharges, aphthae, thrush, sore throat, parasitic stomatitis. urethritis, gonorrhœa, purulent ophthalmia, diphtheria, inflamed glands, influenza, chest diseases, thread worms, neuralgic headaches, ozoena, rheumatic and muscular pains.

*Solanum dulcamara,* in scrofula, syphilis, chronic rheumatism, skin diseases and catarrhal affections.

*Solanum indicum, etc.,* in asthma, dry and spasmodic cough, chest pains, chronic fevers, colic, flatulence, worms, dysuria, dropsy enlarged liver and spleen, and externally toothache.

*Solanum jacquini,* in cough, asthma, catarrh and pain in the chest.

*Solanum nigrum,* etc., in anasarca, heart-disease, fevers, coughs, enlarged liver and spleen, and externally rheumatic and gouty joints, skin diseases and painful swollen testicles.

*Solanum tuberosum,* in scurvy, chronic cough, gout and locally burns.

*Solanum xanthocarpum,* in kidney diseases.

*Sonchus species,* in ascites and hydrothorax.

*Soymida febrifuga,* in dysentery, diarrhoea, intermittent fevers, general debility, and externally rheumatic swellings.

*Sphaeranthus hirtus, etc.,* in bilious affections, goitre and other tumours, worms, bleeding piles, jaundice, glandular swellings, impotence and skin diseases.

Spilanthus oleracea, etc., in toothache, irritation of the gums, salivation, headache, paralysis of the tongue, stammering, and locally inflammation of the periosteum of the jaw.

*Spinacia oleracea, etc.,* in headache, indigestion, applied to head to promote hair growth, fevers, inflammation of the lungs & bowels, urinary calculi, ankylostoma and locally sore throat.

*Spondias mangifera, etc.,* in bilious dyspepsia, scurvy, dysentery, gonorrhoea, and leucorrhoea, wounds caused by poisoned arrows, and locally earache.

*Spongia officinalis,* in dysentery, diarrhœa, and other bowel complaints, and externally for absorbing liquids, dilating cavities and suppurating prolapsed parts.

*Squalus carcharius,* preparations in cachexia, pulmonary consumption, atrophy of body, scrofulous abscesses, suppurating glands, affections of the joints and bones, ulcerations, discharges from the nose or ears, and skin diseases, stricture of the rectum, chronic hydrocephalus, spasmodic coughs and affections, chronic rheumatism, and neuralgia.

*Stannum preparations,* in diseases of the blood, lungs and genito-urinary organs, gonorrhoea, spermatorrhoea, diabetes,

gleet, loss of memory, hæmoptysis, paralysis, asthma, impotency, dyspepsia, jaundice, constipation, and skin diseases.

*Sterculia acuminata,* in physical and nervous fatigue, and locally wounds etc.

*Strychnos colubrina, etc.,* in obstinate malarial fevers, cachexia and dyspepsia.

*Strychnos ignatia,* in cholera, asthma, dropsy, piles, and externally swellings.

*Strychnos nux-vomica,* in bronchitis, diabetes, intermittents, dyspepsia, chronic constipation from atony of the bowels, chronic dysentery, atonic diarrhoea, prolapsus of the rectum, gouty, rheumatic, paralytic and neuralgic affections, worms, tobacco-amaurosis, insomnia from over-fatigue, hydrophobia, bronchitis, emphysema, phthisis, impotency, spasmodic diseases, spermatorrhoea, excessive venery, alcoholism, opium and lead poisoning, nocturnal incontinence, retention of urine and externally headaches, swollen glands, oedema of the hands feet and abdomen, rat-bites and bites of venomous reptiles, muscular and chronic rheumatism, palsy and hypodermically in narcotic poisoning, chronic alcoholism and snake-bites.

*Strychnos potatorum,* in chronic diarrhoea, diabetes, gonorrhoea, and irritation of the urinary organs, and externally in lachrymation, chemosis in the conjunctiva and to boils.

*Styrax benzoin,* in jaundice, incontinence of urine. calculous disorders, distressing coughs, and externally laryngeal, bronchial and spasmodic coughs, cuts and wounds, foul indolent ulcers, and irritable skin eruptions, and uterine discharges.

*Sudarshana churna,* in periodic fever.

*Sulphur and its preparations,* in habitual constipation, piles, prolapsus, stricture, chronic dysentery, epilepsy and nervous diseases, chronic skin diseases, coughs, phthisis, chronic bronchitis with fever, asthma, enlarged liver and spleen acidity and dyspepsia, gout, chronic fevers, rheumatism, worms and blood parasites, tympanites, colic, ascites, meningitis, and externally skin diseases, scrofulous, rheumatic and other painful joints.

*Suvarna makshika,* (See:—Aurum), as a blood purifier.

*Swarna bhasma,* (See:—Aurum), in nervousness, chronic fevers, tuberculosis, neurasthenia, heart-disease, and anæmia.

*Swarna or Suvarna Vanga.* (See:—Aurum), in leucorrhoea and spermatorrhoea.

*Swertia chirata, etc.*, (See:—Ophalia chirata), in chronic malarial fevers, anaemia, dyspepsia, catarrhs, enlarged spleen and liver.

*Swertia decussata,* (See also:—Asphaltum), as nervine tonic.

*Symplocos racemosa, etc.,* in bowel complaints, dropsy, liver affections, fevers, uterine complaints, acute dysentery, chyluria, filariasis, and externally eye diseases, spongy and bleeding gums relaxed ovula, boils and other malignant growths.

*Syzigium jambulanum,* in diabetes.

*Tabernamontana species,* in diarrhoea, worms, and externally ophthalmia, toothache, abscesses, and other skin diseases.

*Tamarindus indica,* in acidity, dyspepsia, constipation, intoxication from datura and spirituous liquors, scurvy, biliousness, bleeding piles, dysentery, scalding urine, colic and externally inflammatory swellings, aphthæ, whooping cough, sore throats, and indolent ulcers.

*Tamarix gallica, etc.*, in leucorrhoea, dysentery, diarrhoea, coughs and chronic discharges, and externally sloughing ulcers, and phagodenic bubœs.

*Taraxacum officinale,* in liver and kidney obstructions, visceral diseases, dyspepsia, jaundice, dropsy, chronic skin diseases and cachectic disorders.

*Techoma undulata,* in spleen diseases.

*Terminalia arjuna, etc.*, in haemorrhages, and other fluxes, diarrhoea, dysentery, sprue, heart-diseases, spermatorrhoea, gonorrhœa, fractures, contusions, and externally ulcers, acne, and other skin diseases.

*Terminalia belerica,* in cough, sore throat, night pollution, worms, dyspepsia, dyspnœa, dropsy, piles, and diarrhœa, and externally to inflamed parts, rheumatism, ophthalmia, etc.

*Terminalia catappa, etc.,* in headache, colic and locally scabies, leprosy, and other skin diseases.

*Terminalia chebula,* in fevers, coughs, asthma, urinary diseases, piles, eye affections, worms, muscular rheumatism, atonic dyspepsia, chronic diarrhœa, vomiting, dysentery, flatulence, colic, enlarged spleen and liver, and externally aphthae, chronic ulcerations burns, scalds and other skin diseases, bleeding piles, and some vaginal discharges.

*Terminalia tomentosa, etc.,* in atonic diarrhœa, and locally indolent ulcers.

*Thymus vulgaris*, as a tonic and antiseptic generally used in combination with others.

*Tinospora cordifolia*, in chronic malarial fevers, chronic rheumatism, and dyspepsia after fevers.

*Toddalia aculeata, etc.*, in remittent and malarial fevers, diarrhoea, constitutional debility, convalescence after fevers, and other exhausting diseases and externally rheumatism and boils.

*Trapa bispinosa, etc.*, in bilious affections, diarrhoea, nervous and general debility, leucorrhoea and menorrhagia.

*Tribulus torrestris, etc.*, in diseases of the genito-urinary system, calculous affections, bloody urine, gleet, cystitis, gonorrhoeal rheumatism, gout, uterine disorders, impotence, Bright's disease with dropsy, spermatorrhoea, and phosphaturia.

*Trichosanthes species*, in bilious fevers, worms, skin diseases, leprosy, and externally headaches, earaches, sores in the ears and nostrils and other ulcers, epilepsy and mental troubles, congested liver and alopecia.

*Trigonella foenumgraecum*, in dyspepsia, colic, flatulence, dysentery, puerperal diarrhœa, rheumatism, chronic coughs, dropsy, enlarged liver and spleen, scrofula, rickets, anaemia, and externally leucorrhoea, burns, and inflamed parts.

*Triphala churna*, in constipation.

*Triticum sativum*, in lumbago, painful joints, epistaxis, menorrhagia, poisoning by salts of mercury, copper, zinc, silver, tin and iodine and externally inflamed surfaces as erysipelas, burns, scalds, tetter, ringworm, hollow ulcers and other skin lesions.

*Tussilago farfara*, for cough and is used as a basis of herbal smoking mixture.

*Tylophora asthmatica*, in dysentery, diarrhœa, respiratory affections, (bronchitis, whooping cough, asthma), syphilitic rheumatism, gout, impurity of blood and locally gouty pains.

*Uncaria gambir*, as ointment with ghee in cancer, alone in diarrhœa, chronic ulcers, obesity and frequent micturition.

*Urginea Indica, etc.*, in bronchitis, emphysema, spasmodic croup, cardiac and renal dropsy, chronic Bright's disease, rheumatism, calculous and paralytic affections, leprosy and skin diseases, and externally inveterate corns, warts and burning of the soles of feet.

*Urine (cow's) and preparations*, in enlarged abdominal viscera, painful dyspepsia, ascites, anasarca, jaundice,

leprosy, chronic prurigo and other obstinate skin diseases.

*Urine (goat's) preparations,* in epilepsy, as laxative and diuretic.

*Urine (horse's)*, in phlegm, ringworm and intestinal worms.

*Urine (Ox's)*, in jaundice, worms, œdema, and diarrhœa.

*Urtica dioica,* in bronchial and uterine catarrh, and hæmorrhage, nettle rash, asthma, and as a blood purifier and tonic and locally burns.

*Valeriana species,* in hysteria, neuralgia, epilepsy, chorea, and other nervous conditions.

*Vanda Roxburghii,* in secondary syphilis, rheumatic and nervous diseases.

*Vateria Indica, etc.,* for external use in chronic rheumatism, and other painful affections, carbuncles and other ulcerations.

*Verbascum thapsus,* in coughs, asthma, bronchial and other pulmonary complaints and locally inflamed parts.

*Vernonia anthelmintica, etc.,* in round-worms, thread-wroms, white leprosy, and other chronic skin diseases and externally for the same and rheumatism.

*Vernonia cinerea, etc.,* in malarial and other fevers, dropsy, spasm of the bladder, strangury, worms, blood-shot eyes, and externally leprosy, guinea-worm and chronic skin diseases.

*Viburnum fœtidum,* in uterine diseases, post partum hæmorrhage, threatened abortion, dysmenorrhœa, and after pains.

*Vinegar,* for sponging the body in fevers; uterine hæmorrhage, and as an application to bruises, headache, scorpion bites and pruritus.

*Viola species,* in bilious and liver affections, kidney diseases, prolapse of the rectum and uterus, coughs and tightness of the chest in children.

*Viscum alba, or V. album, etc.,* in splenic and hepatic enlargements, menorrhagia, hæmorrhages, hysteria, epilepsy, St. Vitus dance (chorea), nervous complaints, palpitation of the heart and locally abscesses.

*Vitex negundo, etc.,* in catarrhal dengue, and puerperal fevers, splenic enlargement, irritable bladder, rheumatism, dyspepsia, colic, worms, diarrhœa, liver diseases, hæmoptysis,

intestinal hæmorrhage and externally acute rheumatism, arthritis, orchitis, gonorrhœal epididymitis, enlarged spleen, catarrh, and headache, fœtid, gangrenous and scrofulous sores, glandular swelling, sinuses, syphilitic skin diseases.

*Vitex peduncularis,* in malaria, kala-azar, black-water fever, and hæmoglobinuric fever.

*Vitex trifolia,* in intermittents, enlarged spleen, amenorrhœa, and locally rheumatic pains and sprains.

*Vitis quadrangularis, etc.,* in bowel complaints, indigestion, irregular menstruation, scurvy, asthma, and externally fractures of bones, otorrhœa, and epistaxis.

*Vitis vinifera,* in bilious fever, anæmia, wasting diseases, heart-diseases, Bright's diseases, gout, acid dyspepsia, genito-urinary diseases, coughs, catarrhs, jaundice, rheumatism, chronic diarrhœa, piles, stone in the bladder and orchitis.

*Viverra civetta,* in hysteria and nervous exhaustion.

*Withania somnifera, etc.,* in alcoholism, emphysematous dyspnœa, consumption, general and seminal debility, nervous exhaustion, loss of memory, leucorrhœa, spermatorrhœa, sterility, lumbago, scrofulous and other glandular swellings, and externally skin diseases, obstinate ulcers, carbuncles and rheumatic swellings.

*Woodfordia floribunda,* in diarrhœa, dysentery and other bowel complaints, internal hæmorrhages, leucorrhœa, menorrhagia, piles, liver disorders, and externally foul ulcers and wounds.

*Wrightea antidysenterica,* in chronic dysentery.

*Wrightia tinctoria,* in piles, fever, diarrhœa, round worms and colic.

*Xanthium strumarium, etc.,* in malarial fever, urinary and renal complaints, gleet, leucorrhœa, menorrhagia, cancer and struma.

*Xanthoxylum species,* in fever, dyspepsia, urinary diseases, skin diseases, rheumatism and locally toothache.

*Zea mays,* in irritable bladder and lithiasis.

*Zinc salts,* and preparations, in syphilitic and scrofulous affections, chronic fever, gonorrhœa, leucorrhœa, epilepsy, hysteria, whooping cough, asthma, dipsomania and externally eye-diseases, abrasions, inflamed skin, eczema, wounds, burns and other skin affections.

*Zingiber officinale, or officinalis,* in dyspepsia, flatulence, colic, stomach ache, indigestion, biliousness, vomiting, spasms, diarrhœa, colds, coughs, asthma, throat complaints, intermittents, general dropsy, (*but not in that of Bright's disease, chronic heart disease*), gout and chronic rheumatism, and externally neuralgias, headaches, cramps, fainting, vaginismus and in the collapse stage of cholera.

*Zingiber zerumbet,* in coughs, asthma, worms, leprosy, and skin diseases.

*Zizyphus jujuba,* etc., in bilious affections, diarrhœa, delirium, pectoral complaints and externally boils, abscesses, carbuncles and other ulcers.

PUBLICATIONS REFERRED TO:

1. Art of Dispensing & Pharmacy Management (1935), by Anant S. Oltikar, Bombay.
2. Catalogue 1950 of The Homeo Chemical and Pharmaceutical Works, Ltd., & Laboratory, Calcutta.
3. Practical Bazaar Medicines, (1920), by Col. G. T. Birdwood.
4. Pharmacology & Therapeutics, (1948), by Dr. M.A. Kamath.
5. Comparative Study of Ayurved, (1927), by Lt.-Col. Chitale.
6. Famous Book of Herbs, by Heath & Heather, Ltd., St. Albans.
7. Pharmacology, Materia Medica & Therapeutics, (1949) by Dr. B.M. Ghosh.
8. Indigenous Drugs Inquiry: A review of the Work, (July, 1939) by Bt. Col. R.N. Chopra.
9. Indian Crude Drugs, Minerals, Economic Produce, Arts and Manufactures (Price-list 1924) by S. N. De, M.Sc., (Botany) B.Sc., (Geology).

## APPENDIX III

### Equivalents & Substitutes for Imported Foreign etc., Drugs

| Drugs obtainable in India | Substitute for Foreign or other drugs including British Pharmacopoeial Drugs |
|---|---|
| Abrus precatorius, root & Extract respectively. | Liquorice root and extract respectively. |

| | | |
|---|---|---|
| Acacia arabica, bark-decoction | .. | Oak bark-decoction—Acacia Senegal. |
| Acacia catechu (Extract from wood). | .. | Uncaria gambier. .. |
| Acacia farnesiana, gum. | .. | Gum Arabic; Acacia Senegal |
| Acalypha indica, juice of plant. | .. | Senega, (root). |
| Aconitum chasmanthum. | .. | Aconitum napellus. |
| Aconitum ferox & other species (root). | .. | Aconite or Monkshood. |
| Aconitum heterophyllum, (root). | .. | Cinchona & its alkaloids. |
| Adansonia digitata, (bark). | .. | Quinine. |
| Adhatoda Vasika. | .. | Senega. |
| Ailanthus malabarica. | .. | Calumba root and Quassia. |
| Aleurites triloba, (oil). | .. | Linseed oil. |
| Aleurites triloba, (oil of seeds). | .. | Castor oil. |
| Alhagi maurorum (Saccharine exud). | .. | Manna. |
| Allium cepa & A. sativum. | .. | Smelling salts. |
| Aloe barbadensis; A. indica; & A. litoralis (inspissated juice). | .. | Barbadoes & Secotrine aloes; Aloe species. |
| Alstonia scholaris (bark). | .. | Cinchona & its alkaloids. |
| Althaea officinalis. | .. | English marsh mallow. |
| Amomum aromaticum, Amomum Xanthioides, (fruit), | .. | Cardamoms. |
| Andrographis paniculata, entire plant, (stalk & roots). | .. | Himalayam chiretta; & Quassia. |
| Andropogon citratus & other species, (volatile oil). | .. | Cajuput oil, (oil of cajuput). |
| Anethum graveolens or Anethum Sowa, (fruit). | .. | Common Dill. |
| Arachis hypogæa (oil of seeds). | .. | Olive oil. |
| Areca catechu, (extract from fruit). | .. | Pale catechu. |
| Argemone mexicana, (oil of seeds). | .. | Castor oil. |
| Aristolochia bracteata (juice). | .. | Quassia. |

| | |
|---|---|
| Aristolochia indica (alkaloid). | Colchicine. |
| Aristolochia indica, (stem & root). | Texan Serpentary (Serpentaria root) i.e., Aristolochia reticulata. |
| Artemisia brevifolia. | |
| Artemisia maritima. | Santonin; (Artemisia Cina Berg). |
| Astragalus strobiliferus. | Astragalus gummifer. |
| Atropa accuminata. | Atropa belladonna. |
| Azadirachta indica (bark). | Cinchona & its alkaloids. |
| Beliospermum montanum (oil of seeds). | Croton oil. |
| Balsamodendron mukul & B. pubescens, (gum-resin). | Myrrh. |
| Banga Bhasma. | Stannoxyl (patent). |
| Bassia latifolia, & B. longifolia, (spirit distilled from flowers). | Wine; Brandy; & Proof and Rectified spirit. |
| Berberis aristata, root. | Taxan (Serpentaria root, Serpentary). |
| Berberis aristata, (bark-extract). | Cinchona bark-extract & Quinine. |
| Berberis asiatica, & other species, (root bark). | Cinchona and its alkaloids. |
| Berthelotia lanceolata, (leaves). | Senna. |
| Borassus flabelliformis, (saccharine juice submitted acetous fermentation) | Vinegar. |
| Borassus flabelliformis, (spirit obtained from saccharine juice or toddy). | Brandy; Wine; & Proof and Rectified spirit. |
| Borassus flabelliformis, (toddy poultice) | Yeast poultice. |
| Borassus flabelliformis, (Downy substance from the base of the fronds) | Matico leaves. |
| Brassia butyracea (Concrete oil) | Theobroma oil. |
| Brucca (nima) Quassioides (Root) | Quassia. |

| | |
|---|---|
| Bryonia epigoea. .. | Chiretta. |
| Butea frondosa, seeds. .. | Santonin. (Santonica); Wormseed. |
| Butea frondosa, gum. .. | Kino gum. |
| Caesalpinia bonducella. (seeds). .. | Cinchona & its alkaloids. |
| Caesalpinia sappan, wood & extract respectively. .. | Logwood, & Logwood extract, respectively. |
| Calotropis gigentea & C. procera, (vegetable mercury) root-bark. .. | Ipecacuanha; Mercury; & Sarsaparilla. |
| Canarium commune (kernels. .. | Sweet almonds. |
| Canarium commune (oil). .. | Almond oil. |
| Canarium strictum. (resin). .. | Burgandy pitch. |
| Cannabis sativa. (flowering tops). .. | Ergot. |
| Carica papaya, (juice of fruit). .. | Santonin; Santonica. |
| Carum (Ptychotis) ajowan & roxburghianum, C. copticum. (fruit & volatile oil). .. | Oils & lavender; Peppermint; dill; aniseed; & caraway; Thyme. |
| Caryophyllus aromaticus (flower-buds). .. | Pimento. |
| Caryota urens (spirit obtained from saccharine juice or toddy). .. | Wine. Brandy; & Proof and Rectified Spirit. |
| Cassia alata & other species (leaves). .. | Senna. |
| Cassia Alata (Extract from leaves). .. | Extract of Colocynth. |
| Cassia angustifolia; C. fistula. .. | Cassia acutifolia. |
| Cassia auriculata, bark. .. | Oak-bark. |
| Cassia species (leaves extract). .. | Colocynth extract. |
| Cedrela toona (bark). .. | Cinchona. |
| Chavica officinarum, (fruit)... | |
| Chavica roxburghii. (fruit)... | Black pepper. |
| Cephaelis ipecacuanha. .. | Cephaelis acuminata. |

| | |
|---|---|
| Chenopodium album. .. | Chenopodium ambrosioides. Chenopodium anthelminticum. |
| Cera alba. .. | Theobroma oil. |
| Chrysanthemum cinerariifolium. (Indian). .. | Pyrethrum (Foreign). |
| Chrysanthemum roxburghii. (flowers). .. | Chamomile flowers. |
| Chrysanthemum roxburghii. (root). .. | Pellitory root. |
| Cicendia hyssopifolia. (plant). .. | Gentian root. |
| Cinchona calisaya. .. | |
| Cinchona ledgeriana. .. | Cinchona. |
| Cinchona officinalis. .. | |
| Cinchona succirubra. .. | |
| Cinnamomum glanduliferum. (root). .. | Sassafras root. |
| Cinnamomum iners, & C. zeylanicum. (inner bark). .. | Cinnamon. |
| Cissampelos pareira. (root). .. | Pareira root. |
| Citrullus colocynthis, (extract). | Colocynth extract. |
| Citrus bergamia. (juice of fruit). .. | Lemon juice. |
| Citrus medica. .. | Citrus limon. |
| Clerodendron inerme. .. | Quinine. |
| Cleviceps purpurea (growing on Indian wheat). .. | Ergot. |
| Cocculus cordifolius. .. | Calumba. |
| Cocculus decoction. .. | Iceland-moss decoction. |
| Cocculus tincture. .. | Tincture of Hop. |
| Cocculus indicus, (alkaloid). .. | Strychnia. |
| Cocculus villosus. .. | Sarsaparilla. |
| Cochlospermum gossypium, (gum). .. | Tragacanth. |
| Cocos nucifera (downy substance from the base of the fronds). .. | Matico leaves. |
| Cocos nucifera (oleine). .. | Cod Liver Oil. |
| Cocosnucifera (saccharine juice submitted to acetous fermentation). | Vinegar. |
| Cocos nucifera (spirit obtained from saccharine | |

| | |
|---|---|
| juice or toddy). | Wine; Brandy; & Proof and Rectified spirit. |
| Colchicum luteum. | Colchicum autumnale. |
| Combretum pilosum (found in Assam). | Santonin. |
| Coptis teeta. (tincture). | Tincture of Hop & Calumba. |
| Cordia latifolia & C. myxa, (dried fruit). | Prunes. |
| Coscinium fenestratum. (stems). | Calumba root. |
| Crinum asiaticum Var. Toxicarium. (bulb & root). | Squill |
| Crinum asiaticum Var. Toxicarium (infusion). | Ipecacuanha infusion. |
| Croton oblongifolius & C. pavana. (oil of seeds). | Croton oil. |
| Croton tiglium. (seed oil). | Elaterium; Ipecacuanha; Tartar emetic). |
| Cucumis hardwickii & C. trigonus. (pulp of fruit). | Colocynth. |
| Cuminum cyminum (fruit). | Coriander. |
| Cybium commersonii (Liver oil). | Cod Liver Oil. |
| Datura alba. & D. fastuosa. (leaves & seeds). | Datura stramonium, & Belladonna. |
| Datura alba. D. fastuosa. (poultice). | Conium poultice. |
| Datura fastuosa. *var.* alba. (leaves extract). | Belladonna leaves extract. |
| Datura fastuosa. *var.* alba. (seeds). | Stramonium seeds. |
| Digitalis lanata; D. purpurea. | Digitalis. |
| Diospyros embryopteris (extract). | Logwood extract; catechu. |
| Dipterocarpus laevis (Balsam exud). | Copaiba, (balsam). |
| Dipterocarpus turbinatus, (Balsam exud.). | Copaiba, (balsam). |
| Dipterocarpus turbinatus, (compound). | Tincture of cubeba. |
| Dipterocarpus turbinatus, (tincture). | Tincture of cubeba. |

| | |
|---|---|
| Dorema aureum (gum-resin). | .. Ammoniacum. |
| Dryopteris blandforii. | Dryopteris. |
| Dryopteris marginata. | .. Dryopteris. |
| Dryopteris Odontoloma. | .. Dryopteris. |
| Echium, sp. of (Gouzaban, Hindi). | .. Sarsaparilla; Pereira brava, Cissampelos pareira). |
| Eclipta alba & E. prostata. | .. Taraxacum. |
| Ehrelia buxifolia. (rod). | .. Elm bark. |
| Embelia ribes. (berries). | .. Kousso & Male-fern |
| Ephedra gerardisna, including E. nebrodensis Tineo & E. vulgaris. | .. Ephedra equisetina. Ephedra sinica. |
| Epicauta nipalensis. (dried insect). | .. Cantherides. |
| Eucalyptus globulus. | .. Eucalyptus species. |
| Eucalyptus resinifera. (gum). | .. Kino. |
| Euphatorium ayapana. (infusion). | .. Serpentary infusion. |
| Euphorbia neriifolia. (juice of leaves). | .. Lobelia. |
| Eurycoma longifolia. | .. Quinine. |
| Exacum bicolor; E. pedunculatum; E. tetragonum. (Roots). | .. Gentian Root. |
| Feronia elephantum. (gum of unripe fruits). | .. Gum acacia; & Bael fruit; i.e., Aegle marmelos. |
| Ferula galbaniflua & F. enarthex. | .. Galbanum; Ferula foetida; F. rubricaulis. |
| Foeniculum panonorium (fruit); & F. vulgare. | ... Common fennel. |
| Garcinia indica. (butter). | .. Vaseline; Spermaceti & Oil of Theobroma. |
| Garcinia morella, (gum resin). | .. Officinal gamboge. |
| Garcinia pictoria. (gum resin). | .. Siam gambose. |
| Garcinia purpurea (Concrete oil). | .. Theobroma oil. |

| | |
|---|---|
| Gentiana Kurroo & Picrorhiza Kurrooa. | Gentianalutea root. |
| Gossypium herbaceum. (root-bark). | Ergot. |
| Gracilaria lichenoides. (decoction). | Iceland moss decoction. |
| Gracilaria lichenoides. (dried plant). | Iceland moss. |
| Gratiola monniera. (alkaloid). | Strychnine. |
| Hemidesmus indicus. (root). | Sarsaparilla root; Dulcamara. |
| Hermodactylus gol. | Colchicum. |
| Herpestis monniera. | Digitalis. |
| Hebiscus rosa sinensis. | English marshmallow-root. |
| Holarrhena antidysenterica. (bark). | Cinchona bark. |
| Hymenodictiyon excelsum. (bark). | Cinchona bark. |
| Hyoscyamus muticus. | Hyoscyamus niger. |
| Hyperanthera pterygosperma. (root). | Armoracia. |
| Ichnocarpus frutescens. (root). | Sarsaparilla. |
| Ipomoea hedereceae & I. nil. (extract). | Extract of Jalap. |
| Ipomoea hedereceae & I. nil. (pill). | Compound gamboge pill. |
| Ipomoea turpethum. | Jalap; (Ipomoea purga); I. orizabensis. |
| Iris germanica. | Iris pallida; I. florentinea. |
| Justicia adhatoda (inspissated juice). | Senega root. |
| Ledebouria hyacinthoides (bulb). | Squill. |
| Liquidambar altingia & L. orientalis. (balsam). | Copaiba; Liquid Styrax or Storax. |
| Lobelia nicotianifolia. | Lobelia inflata. |
| Luffa amara. (kernel of seed). | Ipecacuanha. |
| Lytta assamensis (dried insect.). | Cantharides. |

| | |
|---|---|
| Lytta Gigas; L. violacea (dried insect.). | .. Cantharides. |
| *Makaradhwaja.* | .. Red Sulphide of Mercury. |
| Mallotus phillipinensis. | .. 1. Male fern. 2. Cusso or Kousso (Brayera anthelmintica). |
| Malva sylvestris. | .. Marshmallow. |
| Mangifera indica. (seeds). | .. Santonin; santonica. |
| Melia azadirachta. (leaf-poultice). | Linseed poultice. |
| Meloe trianthema (dried insect). | Cantharides. |
| Mentha arvensis. | Mentha piperita; M. viridis. |
| Michelia champaka. (bark). | .. Guaiacum & Cascarilla. (bark). |
| Micromeria capitellata (plant). | .. Peppermint. |
| Mirabilis jalappa. | .. Jalap. |
| Moringa oleifera. (1. Base out of. 2. Bases from bark). | .. Ephedrine. |
| Moringa pterygosperma. | .. Horse radish. |
| Moringa pterygosperma. (compound). | .. Infusion of Cusparia. |
| Moringa pterygosperma. (infusion). | .. Infusion of Cusparia. |
| Moringa pterygosperma. (root). | .. Armoracia. |
| Musa sapientum. (young leaf). | .. Guttapercha tissue. |
| Mylabris cichorii, (cerate and plaster). | .. Cantharides (Cerate & Plaster). |
| Mylabris cichorii, (dried insect). | .. Cantharides (Cerate & Plaster). |
| Mylabris punctum; M. pustulata; & other species (dried insect). | .. Cantharides (Cerate & Plaster). |
| Myristica malabarica. (concrete oil). | .. Expressed oil of nutmeg. |
| Myrtus caryophyllus. | .. Pimento. |
| Nardostachys jatamansi. (root). | .. Valerian (root); Russian sambul (root). |

| | |
|---|---|
| Naregamia alata. .. | Ipecacuanha. |
| Ocimum basilicum. (seeds). .. | Plantago ovata (seeds). |
| Onosma bracteatum. .. | Sarsaparilla. |
| Ophelia angustifolia, O. densifolia; & O. elegans (plants). .. | Chiretta. |
| Ophelia chirata. (dried plant). .. | Gentian root. |
| Oryza sativa. (decoction). .. | Barley decoction. |
| Oryza sativa. (seeds—ground & sifted) (rice-flour). | Wheaten flour. |
| Oryza sativa. (seed husked) .. | Pearl Barley. |
| Papaver somniferum, (Cryst Principle), (Nicotine). | Cinchona & its alkaloids. |
| Papaver somniferum. inspissated juice). .. | Smyrna or Turkey opium. |
| Pharbitis nil (seeds). .. | Jalap. |
| Phyllanthus emblica. (dried fruit). .. | Oak galls. |
| Phyllanthus emblica. (extract from wood). .. | Catechu. |
| Picrasma quassioides. | Picrasma excelsa. |
| Pimpinella anisum. | Illicium verum; I. religiosm. |
| Pinus deodara; & P. longifolia. (products of distillation). .. | Tar & Turpentine. |
| Pinus longifolia. (oleo-resin). .. | Galbanum; Pinus palustris; P. taeda. |
| Pinus longifolia (ointment). .. | Ointment of Elemi. |
| Piper nigrum. .. | Cinchona & its alkaloids. |
| Pistacia Khinjuk. (galls). .. | Oak galls. |
| Pistacia Khinjuk. & P. Kabulica. (resin). .. | Mastiche. |
| Plantago ispaghula. (decoction). .. | Barley decoction. |
| Plantago ovata. (seeds). .. | Linseed infusion or tea. |
| Plumbago rosea. .. | Cantharides. |
| Plumbago rosea. (plaster). .. | Cantharides plaster. |
| Plumbago rosea. & P. zeylanica. (root bark). .. | Mezereon bark. |
| Podophyllum emodi (vegetable calomel). | |
| Podophyllum hexandrum. .. | Calomel; Podophyllum |

| | |
|---|---|
| Polygala chinensis; & P. crotalarioides; & P. telephioides (plants). .. | peltatum. Polygala senega. |
| Psychotria ipecacuanha. .. | Cephaelis ipecacuanha. |
| Ptychotis ajowan. .. | Oils of lavender; peppermint, thyme, dill, caraway, coriander & anise. |
| Punica granatum. (bark-decoction). .. | Decoction of Oak bark. |
| Punica granatum. (rind of fruit). .. | Decoction of Oak bark. |
| Punica granatum. (root-bark). .. | Male-fern (Felix mas). |
| Randia dumetorium. .. | Ipecacuanha. |
| Rheum emodi; R. webbianum & other species (root). .. | Rheum palmatum, etc. Chinese or Tibetan or Turkish (rhubarb). |
| Rhus succedanea. (galls). .. | Oak galls. |
| Rumex maritimus; & R. Nepalensis. .. | Rhubarb. |
| Ruta angustifolia. (plant). | Rue. |
| Salix fragilis. .. | Salix sp. & S. populus; S. purpurea. |
| Samadera indica. (wood & bark). .. | Quassia. |
| *Samudra phena.* .. | Calcium. |
| Santalum album, (oil-volatile). .. | Copaiba; & Eucarya spicata. |
| Scilla indica. (bulb). .. | (Squill), Scilla maritima; Urgenia scilla or U. maritima. |
| Scopolia lurida. (leaves). .. | Belladonna. |
| Sesamum indicum. (expressed oil from seeds). | Olive oil. |
| Shorea robusta. (Resin). .. | Pine resin. |
| Sida cardifolia. (alkaloid). .. | Epherdine. |
| Sinapis juncea (powdered seed). .. | Mustard. |
| Smilax chinensis. (syrup). .. | Sarsaparilla syrup. |
| Smilax glabra; S. lanceaefolia; Smilax ovalifolia; S. sp of (Tseinapho, Burm.). (root). .. | Jamaica sarsaparilla. |

| | |
|---|---|
| Soymida febrifuga, (bark & decoction of bark). | Oak bark & decoction of Oak bark. |
| Squalus carcharias (liver oil & lard). | Cod Liver Oil & lard. |
| Strychnos nux-vomica. (seeds & alkaloid). | Cinchona and its alkaloids. |
| Styrax benzoin, (grown in Govt. gardens in Bangalore). | Styrax benzoin; S. paralleloneurus; S. tonkinensis. |
| Tamarix gallica; Tamarix orientalis. (galls). | Oak galls. |
| Termanalia arjuna. | Digitalis & adrenalin. |
| Terminalia catappa. (kernels). | Sweet almonds. |
| Terminalia catappa. (oil). | Almond oil. |
| Terminalia chebula. (dried fruits). | Oak-galls. |
| Terminalia catappa. (fruit-powder). | Tannic acid. |
| Thevetia neriifolia; or T. peruviana, (glucoside). | Digitalis. |
| Tinospora cordifolia, root & stem. | Calumba root; Sassafras. |
| Toddalia aculeata. (root-bark). | Cusparia bark & quinine; (cinchona & its alkaloids). |
| Toddy poultice. | Yeast poultice. |
| Tribulus terrestris. | Barosma betulina; Uva Ursi. |
| Trichosanthes cordota. | Calumba root. |
| Trichosanthes nervifolia, (extract of fruit). | Elaterium. |
| *Triphala* ointment. | Calamine cerate. |
| Tyolophora asthmatica. (root & leaves). | Ipecacuanha and Sarsaparilla |
| Tyolophora indica. (root & leaves). | Ipecacuanha and Sarsaparilla |
| Typha angustifolia. | Medicated cotton wool. |
| Urginia indica. (bulb). | Urginea maritima or U. scilla (Squill). |
| Valeriana leschenaultic *var*, brunoniana; hardwickii; & wallichii; (root stalk). | Valerian; Russian Sumbul-root. (Valeriana officinalis). |
| Vateria indica. (resin). | Pine resins. |

| | | |
|---|---|---|
| Vernonia anthelmentica. (seeds). | .. | Santonin; Santonica. |
| Viola odorata. | .. | Ipecacuanha. |
| Vitex pedicularis. | .. | Quinine. |
| Withania coagulans. | .. | Rennet. |
| Zingiber cassumunar; Z. zerumbet. (Rhizome). | .. | Ginger. |

## MISCELLANEOUS

| | | |
|---|---|---|
| Achyranthes aspera. (plant). | .. | Yields on incineration a large proportion of *potash*. |
| Aconitum ferox & other species (root). | .. | As a source of *Aconitia*. |
| Areca catechu (unexpanded petioles). | .. | Form excellent splints. |
| Bambusa arundinacea. stems). | | for fractures etc. |
| Blumea grandis. (plant). | .. | As a source of *Camphor*. |

Calotropis gigantea, is regarded in some parts as "Vegetable mercury".

| | | |
|---|---|---|
| Citrus bergamia (juice of fruit). | .. | As a source of *Citric acid*. |
| Clitoria ternatea. (Syrup of the flower). | | As a colouring agent. |
| Hibiscus rosa-sinensis, (petals). | .. | Substitute for litmus as a test. |
| Musa sapientum. (leaves). | .. | Form excellent dressing for blistered or excoriated surfaces; also as an impermeable covering, water-dressing, and shades for the eyes in ophthalmia. |
| Phyllanthus emblica. (wood). | .. | As a means of clearing muddy water. |
| Pterocarpus santalinus. (wood). | .. | As a colouring agent in place of cochineal. |

| | |
|---|---|
| Salicornia indica; S. brachiata & other species. (plant). .. | Yield on incineration large quantities of *Barilla*. |
| Squalus carcharias (Stearine). | Substitute for *Lard* in pharmacy. |
| Strychnos potatorum. (seeds). .. | As a means of clearing muddy water. |

---

*Reference:*—

(Pages 429—430 of "Bengal Pharmacopoeia".

*Publications referred:*—

(1) Druary's Pharmacopoeia of India or Bengal Pharmacopoeia (old edition).

(2) Indigenous drugs Inquiry: A review of the work by Bt. Col. R. N. Chopra. (July 1939).

(3) Distribution of British Pharmacopoeia Drug. Plants and their Substitutes growing in India, (1951) by S. L. Nayar & I. C. Chopra.

(4) Indian Crude Drugs, Minerals, Economic Produce, Arts & Manufactures (Price List 1924) by S. N. De, M.Sc., (Botany), B.Sc., (Geology).

---

# THERAPEUTIC INDEX OF DISEASES & AILMENTS
## (with their Equivalents in Sanskrit) and their REMEDIES.

---

*N.B.*—(1) Majority of Indian Preparations are in italics.

(2) Letters "P. H. T." herein, refer to "Practical Homoeo Therapeutics" by Dr. J. B. Ghoshal.

(3) As all the drugs hereunder have been alphabetically treated in the main contents of this volume, marking of Pages numbers against each was considered redundant.

**1. ABORTION:**

**(Garbhapata):—**
**(or Garbhasravam):—**

Anona squamosa.
Artemisia vulgaris.
Borax.
Carum Carui.
Euphorbia R.
Fel bovinum purificatum.

Ferula A. & F.
Gymelina A.
*Javarish-i-lulu.*
} (habitual).

Moringa pterygosperma.
Pandanus O.
Plumbago species.
Viburnum F.
} (threatened)

**2. ABSCESSES:**

**(Vidradhi):—**

Achyranthes aspera.
Amaranthus Poly.
Ananas sativus (P.H.T.)
Anona squamosa.
Balsamodendron mukul.
Basella A.
Brassica olerecea (P.H.T.)
Cassia tora.
Datura fastuosa.
Desmodium T.
Hydnocarpus I.
Indigofera A.

Jasminum P. & S.
Moringa pterygosperma.
Papaver S.
} (mammary)

Pinus species.
Peucedanum species.
Phaseolus species.
Plumbago zeylanica.
Saccharum O.
Sesbania species.
Sida A.
Solanum xanthocarpum.
} (mammary)

Squalus C. preparations.
*Svalpa Masha Taila.*
Tabernamontana species.
Viscum A. etc.
Zizyphus J. etc.
} (scrofulous)

**3. ACIDITY (Amlapitta) or Vidagdhajeeranam):—**

Aqua ptychotis.
Musa S.
Pterocarpus M. (pyrosis).
Sodium salts and preparations.
Sulphur and its preparations.
Tamarindus indica.

**4. ACNE: (Yavvanpedaka: Youvanpitka):—**

Citrus A.
Ferula G.
Randia D.
Strychnos nux-vomica *(P.H.T.)*
Terminalia A. etc.

**5. AGALACTIA:—**

Ricinus communis *(P.H.T.)*
Urtica urens *(P.H.T.)*

**6. AGUE:—**

Andrographis P.
Citrus L.
Euphatorium A.
Fumaria O.
Phoenix species.
Quinetum.
Quinine.
Siegesbeckia O. etc.

**7. ALBUMINURIA: (Lalmoha or Lalamcham):**

See also Bright's disease:—
*Chandraprabha gutika.*
*Gokshuradi guggula.*

**8. ALCOHOLISM: (Panathyaya); (Paramadapana; Madatyaya):—**

Avena sativa. *(P.H.T.)*
Citrus aurantium. *(P.H.T.)*
Hyoscyamus. *(P.H.T.)*.
Musa S.
Papaver somniferum. *(P.H.T.)*.
Ptychotis ajowan. *(P.H.T.)*.
Pyrus malus. *(P.H.T.)*.
Ranunculus scleratus. *(P.H.T.)*.
Sinapus J. (chronic).
Strychnos N. *(P.H.T.)*
also intoxication from datura.
Tamarindus I.
Withania S. etc.

**9. ALOPECIA: (Indraluptham):—**

Abrus precatorius.
Aloe barbadensis.
*Bhringaraj taila.*
Eclipta E.
Hedychium S.
Hibiscus Rosa S.
Myristica F.
Myrtus C.
Plumbum and its Salts.
Trichosanthes species.

**10. AMAUROSIS: (Sleshmavidagdhadristu):**

Nicotiana tabacum.
Strychnos N.

**11. AMENORRHOEA: (Aarthavadhosha, Kshinartav):—**

Aloe barbadensis.
Aristolochia indica.
Artemisia vulgaris.
Balsamodendron My.
Brassica A.
Butea frondosa.
Carum carui.
Crocus S.
Crotalaria J.
Erythrina indica.
Euphorbia T.
Foeniculam V.
Gossypium I. & H.
Helleborus N.
Hydrocotyle A.
Hyssopus O.
Parmelia P.
Peganum H.
Rubia C.

Salvadora species.
Sapindas T.
Semecarpus A.
Sesamum I.
Silicium salts.
Sodium salts and preparations.
Trianthema monogyna.
Vitis Q.
Vitex T.

**12. ANAEMIA:**
**(Panduroga):—**

*Abhra bhasma.*
Adhatoda vasika.
*Bisama-jarantak lauha.*
*Brahat-Sarva-Jvara-hara Lauha.*
*Brihat Sudarshana Churna.*
Cinnabar.
Coccus lacca.
*Dhatri lauha* or *Leha.*
Emblica O.
Ferri Sulphas.
Hydrargyrum.
*Jakridari lauha.*
*Kalpam.*
*Kalyanaksharam.*
*Lauhabhasma.*
*Lohasava.*
*Navayasa lauha.*
Physalis species.
*Puta-Pak-Bisama Jvarantaka lauha.*
Semecarpus A.
*Svarna-makshika.*
*Trailokyachintamani Rasa.*
Trigonella F.
*Tryushanadi Lauha.*
*Visamajvarantaka Lauha.*
Vitis.

**13. ANASARCA:—**

Achyranthes A.
Aegle marmelos.
Allium S.
Alocasia I.
Apis. *(P.H.T.).*
Apium G.
Boerhavia D.
Calotropis G.
Croton T.
Cynodon D.
*Dasamuli haritaki.*
*Dugdhavati.*
Gmelina A.
*Gudashtaka.*
Helleborus niger. *(P.H.T.)*
Hygrophila S.
*Ichchavedi rasa.*
*Ichchavedi vatika.*
Jatropha Mon.
*Manmandu.*
*Patoladya churna.*
*Punarnavastaka.*
*Punarnava taila.*
*Rasa parpati.*
Solanum & X.
*Sulachanamritabhra.*
*Suvarna or Swarna parpati.*
Tartar Emet *(P.H.T.).*
*Tryushanadi Lauha.*
*Urine* (cow's and preparations.
Urine (Ox's).
*Varunadya guda.*
*Vijaya parpati.*
(with diarrhoea)

**14. ANOREXIA:**
**(Arochaka):—**

*Amlica pana.*
*Amritakalpa rasa.*
Cervus dama.
Cuminum C.
*Drakshasava.*
Elettaria C.
Emblica O.
Feronia E.
Gentiana K.
*Jatiphaladya churna.*
*Kapithaastaka churna.*
*Pippali arista.*
Piper longum.
Quassia E.

*Ramabana rasa*
Sodium salts, and its preparations.
*Vadavanal churna.*

**15. ANURIA: (Mutraghatana); See also "Diuretics":—**

Allium sativum.
Ammonii Carbonas.
Andropogon Muricatus.
Cyperus rotundus.
Iris P.
Potassium salts. (Potasii carbonas).
Silicium salts.
Sodium salts and preparations.
Strychnos N.

**16. APHONIA: (Svarabhanga; Mookatva or Vaksangam):—**

Herpestis M.
Mangifera I.
Nigella S.

**17. APHTHAE: (Sarvasara-mukharoga):—**

Acacia arabica.
Berberis A. (sores)
Cajanus I. (sores)
Embelia R. (sores)
Emblica O. (sores)
Eucalyptus G. (sores)
Ficus R. (sores)
*Grahanikapata Rasa (Sprue).*
Indigofera Tinc.
Jasminum grandiflorum.
Lawsonia alba.
Myrica N.
Myrtus C.
Rosa species.
Silicium salts.
Sodium salts and preparations.
*Svalpakhadiravatika.*
Tamarindus I.
Terminalia Cheb.

**18. APOPLEXY: (Sanna; Sannyasa):—**

Camphora O.
Croton T.
Garcinia P.
Helleborus N.
Sinapis J.

**19. APPENDICITIS: (Aristolochia bracteata):—**

Piper Nigrum.

**20. ARDOR URINAE: (See also:—Strangury):—**

Glycyrrhiza G.
Gmelina A.
Hibiscus Rosa S.
*Punarnava Leha.*
Silicium salts.

**21. ARTHRITIS: (Sandhivata):—**

Acalypha I.
*Adityapaka guggula.*
Anisomelos M. (gouty)
Balsamodendron M. (gouty)
*Chitra Kathi.* (rheumatic) (gouty)
Garcinia P. (gouty)
Gossypium herbaccum. (gouty)
Solanum nigrum. (gouty)
Thespesia populnea. (gouty)

*Kubja prasarini taila.* (stiff-joints)
Linum U. (stiff-joints)
Phaseolus species. (stiff-joints)
Ricinus C. (stiff-joints)
Saussurea L. (stiff-joints)

Semecarpus A. (acute).
Spilanthus O.

Squalus C. preparations. (jaw inflammation)
Vitex N. etc. (jaw inflammation)

**22. ASCARIDES:—**

Indigofera tinctoria. *(P.H.T.)*

**23. ASCITES: (Jalodhara); See:—Purgatives and Liver tonics:—**

Acetic acid *(P.H.T.)*.
Achyranthes A.
Ammonii Carbonus.
Andropogon I.
*Apang Kshar.*
Arsenic *(P.H.T.)*.
Boerhavia D. & R.
Calotropis G.
Cedrus deodara.
Citrullus C.
Clitoria T.
Crataeva N.
Croton T.
*Dugdhavati.*
Hygrophila S.
*Ichchhavedi rasa.*
*Ichchhavedi vatica.*
*Jalodarari Rasa.*
*Kalyanaksharam.*
Luffa E.
*Mahanaracha Rasa.*
*Manmandu.*
Moringa P.
*Naracha rasa.*
*Patoladya Churnam.*
Pavetta I.
Piper longum.
Plumbago zeylanica & R.
Potassium salts.
*Punarnavastaka.*
*Rasayanamrita Leha.*
Semecarpus A.
Serpent poison preparations.
Sodium salts and preparations.
Sonchus species.
Sulphur and its preparations.
*Suvarna parpati.*
Urine (cow's) and preparations.
*Varunadya guda.*
*Visamajvarantaka Lauha.*

**24. ASTHMA: (Svasakasam); Shwas (Tamaka); See also "Expectorants"):—**

*Abhra bhasma.*
Abies W.
Acalypha indica.
Achyranthes aspera.
Acorus **calamus.**
Adhatoda V.
Aegle marmelos.
Ailanthus E.
Alhagi maurorum.
*Allae pauk.*
Allium sativum.
Aloe B.
Alum *(P.H.T.)*.
Althaea O.
Andropogon C.
Aplotaxis auriculata.
Arsenic, white.
Bambusa A.
*Banga bhasma with copper.*
Beninkasa C.
Blatta Orientalis *(P.H.T.)*.
Boerhavia diffusa.
Borax.
Calotropis gigentea.
Camphora O.
Carum copticum.
Cassia S.
Cervus dama.
*Chaturmukha Rasa.*
Cinnamomum tamala.
Coleus A.
*Cowrie bhasma.*
Crocus S.
Cubeba officinalis. *(P.H.T.)*
Daemia E.
Datura A. & F.
*Diamond bhasma,* with vasaka, long pepper, and sugar.
Ephedra vulgaris.
Erythroxylon C.
Euphorbia N. P. & Tir.
Ferula A. F. & G.
Ficus R.

Flacourtia C.
Galega E.
Glycyrhiza glabra.
*Gorochanam,* due to worms).
*Grahani mihira taila.*
Hedyotis U.
Hedysarum A.
*Hingvadi Dhum.*
Hygrophila S. (Cough).
Hyocyamus N.
Hyssopus O.
Indigofera Tinc.
*Jatiphaladi churnam.*
Justicia adhatoda.
*Kalyanaksharam.*
*Kanakasava.*
*Khaphaketu rasa.*
*Katphaladi Churna.*
*Khandakooshmanda.*
*Kumariasava.*
Lectuca S.
*Lavangadi Churna.*
Lycopersicum E.
*Mahalakshmibilas.*
*Mahasvasari Lauha.*
*Mrityanjaya Rasa.*
*Mukta Bhasma.*
Myrica N.
Myristica F.
Nicotina T.
Opuntia Lillenii.
Papaver S.
Peganum H.
Picrorrhiza Kurroa.
Piper longum, & nigrum, & chaba.
*Pippali Arista.*
*Pippuladi Lauha.*
Pistacia integerrima.
Polyporus O.
Potassii Nitrus.
Potassium salts.
Premna herbacea.
Randia D.
Rhus S.
Sassurea L.
Scindapsus O.
Semecarpus A.
*Sinhanada guggula.*
Solanum I. & X.
Squalus C. preparations.
Stannum preparations.
Strychnos I. & S. Nux-vomica. (P.H.T.).
Styrax B.
Sulphur and its preparations.
*Suryavartha Rasa.*
*Suvarna Bhasma.*
*Swasabhairava Rasa*
*Swasa Chintamani.*
*Swasa Gajankusa.*
*Swasakasa Chudamani.*
*Swasa Kuthar Rasa.*
*Talisadya Churna.*
Termanalia C.
Tylophora A.
Urtica D.
*Vasakushmanda kanda.*
*Vasava Leha.*
Verbascum T.
*Vijaya Vati.*
Vitis Q. etc.
Zinc salts and preparations.
Zingiber O. & Z.

**25. BALANITIS:—**

Basella A.

**26. BALDNESS:**
**See "Alopecia".**

**27. BARRENNESS:**
**See "Sterility".**

**28. BED SORES:**
**See "Sores".**

**29. BILIOUSNESS: (Pitthadhikyam):—See also Diseases of the Liver:—**

Adhatoda vasika.
Andrographis paniculata.
Andropogon Muricatus.
Cassia fistula.
Cinnamomum camphora.

Cuminum cyminum.
Cyperus rotundus.
Eclipta Erecta.
Emblic myrobolum.
Feronia E.
Garcinia X.
Hibiscus A.
Ipomoea turpethum.
Lavendula S.
Lycopersicum E.
Santalum album.
Mentha S. (vomiting).
Mollugo cerviana.
Momordica C.
Nicotina T. (giddiness).
Piper longum.
Ptychotis A.
Saccharum officinarum.
Sphaeranthus H. etc.
Tamarindus I.
Trapa B. etc.
Viola species.
Vitis vinifera.
Zingiber O.
Ziziphus J. etc.

**30. BITES: (Daunsha or Damsam):— (Scorpion and Insects):—**

Achyranthes aspera.
Allium C. & Sativum.
Argemone M.
Aristolochia I.
Bryophyllum calycinum.
Camphora officinarum *(P.H.T)*.
Feronia elephantum.
Helitropium I.
Ocimum basilicum

(Scorpion):—
Alum *(P.H.T.)*
Ammonii Carbonas.
Boerhavia diffusa.
Calotropis gigantea.
Carica P.
Cissampelos P.
Citric acid *(P.H.T.)*
Citrullus C.
Cupri sulphas.
Curcuma L.
Cyperus R.
Dilute Acetic acid *(P.H.T.)*
Eclipta E.
Euphorbia Tir.
Ferula A.
Gloriosa S.
Mucuna P.
Nerium O.
Saturated solution of salt put in eyes *(P.H.T.)*
Tamarindus indica *(P.H.T.)*

(Insect):—Cassia alata.

(Centipedes):—
Gloriosa superba.
Goleus A.
Hibiscus P.

(Venomous reptiles):—
Acetic acid *(P.H.T.)*
Alum *(P.H.T.)*
Atrocarpus integrifolia leaves.
Butter milk *(P.H.T.)*
Earthworm (P.H.T.)
Eclipta alba.
Euphatorium A.
Fowls *(P.H.T.)*
Heliotropium indicum.
Indigofera tinctoria.
Musa sepientum trees' juice.
Nictotiana tobacum *(P.H.T.)*
Piper longum & chaba.
Potash permanganate *(P.H.T.)*
Rauwolfia S.
Sapindas trifoliatus.
Strychnos N.

(Venomous insects):—
Feronia E.
Indigofera Tinct.
Kalanchoe L.
Ptychotis A.
Ranwolfia S.
Sacchrum O.
Sapindas T.

(Serpent):—

Aegle marmelos.
Aristolochia indica.
Lavendula B.
Luffa Am.
(Dog):—
Moringa P.
(Leech):—
Polyporous O.
(Venomous & Rabid animals):—
(1) Alangium lamarckii.
(2) Cephalandra indica.
(3) Indigofera tinctoria.
(4) Sapindas T.
(5) X-anthium strumarium.
(Rat):—
Strychnos N.

**31. BLADDER COMPLAINTS: See "Cystitis" and "Urinary complaints"**

**32. BLISTER:—See "Ulcers".**

**33. BLOOD DISEASES: (See also Leprosy, Scrofula, Syphilis, Skin diseases &c.):—**

Stannum preparations.
(Parasites):—
Sulphur and its preparations.
(Impurity):—
Anthocephalus C.
Diospuros E.
Hemidesmus I.
Mimosa P.
Trichosanthes C.
Tylophora A.

**34. BOILS: (Visphota; Vidhradhi; Peetika; or Pitika):—**

Acacia catechu.
Allium cepa.
Anona squamosa.
Asparagus racemosus.
*Banga Bhasma.*
Basella A.
Bryophyllum calycinum.
Butea frondosa.
Cinnamomum camphora.
Curcuma L.
Diospyros embryopteris.
Gynandropsis P.
*Haridra khanda.*
Heliotropium I.
*Khadirastaka.*
Lippia N.
Melia azadirachta.
Mirabilis J.
Oxalis corniculata.
Peucedanum species.
Piper species.
*Praval bhasma.*
Pterocarpus M.
Saccharum O.
Sapindas T.
Santalum album.
Saxifraga L.
Sesbania species.
Sida A. & C.
Strychnos P.
Symplocos R.
Tamarindus I.
Toddalia A. etc.
Trichosanthes C.
Vitex N. & T.
Zyzyphus J. etc.

**35. BOWEL COMPLAINTS:—**

Anacyclus P.
Andropogon N.
Eucalyptus G.
Euphorbia T.
*Grahanikapata Rasa.*
Holarrhena A.

Oryza S.

Ricinus O.

Spongia O.

(Irritable or inflammatory.)

(Pains):—
*Sula gaja kesari.*
Vitis Q. etc.
Woodfordia F.

Chronic:—
*Akara-karabhadi churna.*
*Dadimastaka.*
*Dugdhavati.*
*Kalu bhasma.*
*Manmandu.*
Ostrea E. and its preparations.
Punica G.
Sida A.
*Suvarna Parpati.*
(Rectal prolapse):—
Oxalis C.
(Irritations):—
Papaver S.
Peucedanum species.
(Catarrh):—
Phaseolus species.
(Obstructions):—
Picrorrhiza kurroa.
Pimpinella A.
Rubia C.
(Tympanites):—
Piper species.
Plantago I.
(Ulceration):—
Plantago I.
Portulaca species.
Ranwolfia S.
(Duodenal catarrh):—
Rheum E.
Saline substances.
(Spasms):—
Sinapis J.
(Inflammation):—
Spinacea O.

**36. BRAIN AFFECTIONS: (Cerebral Congestion):—**

Garcinia P.
Hedysarum G.
(Fag):—
Avena Sativa *(P.H.T.)*
Herpestis M.
*Makaradvaja.*
Musa sapientum (bananas) (P.H.T.)
(Meningitis):—
*Panchavahtra Rasa.*
*Payaesam or ksheer of* Achyranthes aspera.
(Loss of memory):—
*Magzsudhi.*
*Majoonai Kuvathiabah.*
Stannum preparations.
*Vrihat Panchamula.*
Withania S. etc.

**37. BRIGHT'S DISEASE: (Chronic):—**

Juniperis C.
Urginia I. etc.
Sodium salts and preparations.
(With dropsy):—
*Shoathahar Loha.*
Tribulus T.
*Tryushanadi Lauha.*
Vitis V.

**38. BRONCHITIS: (Kas-Cough) (Cough-janya) Pittajanyakasa):—**

See ("Expectorants" and also "Respiratory Diseases":—
Abies W.
Acalypha indica.
Aconitum nepellus *(P.H.T.)*
Acorus C.

Adhatoda V.
Aegle marmelos.
Ailanthus E. & M.
(Chronis):—
Allium C.
*Ambritashatakapachana.*
Asphaltum.
Borax.
*Brihat Singarabhra.*
Calotropis gigantea.
Carum copticum.
*Chandramrita rasa.*
Cinnamomum camphora.
Clitoria T.
Diamond *bhasma* with long pepper and sugar.
Dipterocarpus T.
Euphorbia P.
Ferula G.
Sulphur and its preparations.
(Children's):—
Aquilaria A.
Asclepias A.
Boswellia G.
Cephalandra I.
Croton T.
Cubeba O.
*Eladi churnam.*
Eletteria C.
Eucalyptus G.
Ferula A.
Flacourtia C.
Glycyrrhiza G.
Herpestis M.
Hyssopus O.
Ipomoea D.
Lactuca S.
*Lavangadi churnam.*
Linum U.
Lycopersicum E.
*Madanadi-vamana.*
*Majoonai Sual.*
Musa paradisiaca.
Myristica M.
Papaver S.
Phoenix species.
Pimpinella A.
Pinus species.
Piper cubeba, & betel.
Potassium salts.
*Rajamriganka Rasa.*
Randia D.
Rhus S.
Ruta G.
Semecarpus A.
Solanum Xanthocarpum.
Strychnos N.
Styrax B.
Sulphur corrected with *tricatu-churna* and ghee.
Terminalia chebula.
Urgina I.
*Vidarigandadigana Quath.*
Zingiber officinale.

**39. BUBOES: (Bada Vamkshanagrandhi):—**

Amaranthus poly.
Arum C.
Ficus H.

**40. BURNING OF PALMS AND SOLES OF FEET:—**

*(Hastadaha; Padadaha):—*
Hedyotis U.
(Soles of feet):—
Lagenaria V.
Mesua F.
Momordica C.
Urgina I. etc.

**41. BURNING SENSATION:—**

Andropogon muricatus.
Cinnamomum camphora.
Crataeva religiosa (in soles of the feet).
Cyperus rotandus.
Ghee.
Glycyrrhiza glabra.
Hemidesmus indicus.
Mesua ferrea (in soles of the feet).
Mollugo cerviana.

Pterocarpus santalinus.
Rose-water.

**42. BURNS & SCALDS: (Agnidagdha-vrana; Dagdha-vrana):—**
**See also "Antiseptics"**

Aloe barbadensis.
Basella A.
Bicarbonate of Soda *(P.H.T.)*
Cocos N.
Flour and lard applied in equal parts.
Ghee. *(P.H.T.)*
Gossypium I. & H.
Indigofera T.
Lawsonia A.
Lime Liniment *(P.H.T.)*
Linum U.
Mangifera I.
*Manjishtadya ghrita.*
Mel depuratum.
Mentha piperata oil *(P.H.T.)*
Oryza S.
Portulaca species.
Rubia C.
Rumex C.
Saccharum O.
Sesamum I.
Silicium salts.
Solanum T.
Terminalia Cheb.
Trigonella F.
Triticum S.
Urtica D.
Zinc salts and preparations.

**43. CACHEXIA:—**

Squalus C. preparation.
Strychnos C. etc.
Taraxacum O. etc.

**44. CALCULI: (Ashmari Sikata):—**

Acorus calamus.
Boerrhavia diffusa.
Bombax Malabaricum.



Citrus limonum.
Coleous aromaticus.
Crataeva R.
Dolicos Bif.
Erigeron C.
*Gokshuradi Guggula.*
Hygrophila S.
Indigofera G.
Lawsonia A.
Moringa P.
Papaver S.
Pavetta I.
Pedalium M.
Potassium salts.
Pyrus species.
Raphanus S.
Salvadora P. & O.
(Uric acid):—
Saxifraga L.
Silicium salts.
Sida R.
Solanum Xanthocarpum.
(Urinary):—
Spinacea O. etc.
Styrax B.
Tribulus T.
Vitex V.
(Stone in the bladder):—
*Trivikrama rasa.*
Urgina I. etc.
See also "Diuretics" in Appendix I.

**45. CANCER (Mansarbhuda; Valmeekam):—**

Acacia catechu.
Citrus limonum *(P.H.T.)*
Indigofera A.
Kaempfera R.
Papaver S.
Xanthium S. etc.

**46. CARBUNCLE: (Calpuli; Vinata-pramehapitaka)— See also "Boils".**

Camphor spirits and lime water equal parts *(P.H.T.)*

Curd.
Daemia E.
*Kalagnirudra rasa.*
*Lauha bhasma.*
Nitric acid *(P.H.T.)*
Papaver S.
Saccharum O.
Santalum album.
Vateria I.
Withania somnifera.
Zizyphus J. etc.

**47. CATARACT:—**

Colchicum *(P.H.T.)*

**48. CATARRH: (Nasal): (Prathisyayam):— See also "Antiphlogistics".**

Aconitum ferox & nepellus.
Agati G.
Allium C.
Aristolochia I.

Mesua F.

Ocimum S.

Sesbania G.

Desmodium gangeticum.

(Fever):—
Alstonia S.
Andropogon C.
(chronic):—
Balsamodendron O.
Baleria P.
Barringtonia A.
Basella A.
Calotropis gigantea.
Coriandrum S.
Curcuma L.
Eclipta E.
Erythroxylon C.
Glycyrrhiza glabra.
Hordeum V.
*Ithrphal.*
*Kapha ketu rasa.*
Musa S.
Nigella sativa.
Piper species.
Ptychotis A.
(laryngeal):—
Rumex C.
(bronchial):—
Santalum A.
Solanum D. & X.
Swertia C. etc.
Utrica D.
Vitex N. etc.
Vitis V.

**49. CEPHALALGIA:—**

Asclepias A.
Bassia La.
Eclipta E.
Emblica O.
Michelia C.
Nelumbium S.
Saussurea L.

**50. CHANCRE: (Dustavrana: Upadamsha; Mehavrana):— See "Sores"; "Syphilis" and "Ulcers"**

**51. CHICKEN-POX: (Kanjinya):—**

Curcuma L.

**52. CHLOROSIS: (Panduroga):—**

Balsamodendron My.
Crocus S.
Gossypium I.

**53. CHOLERA: (Vishuchi; Vishoochika; Phatkee):— See:—Vomiting, Diarrhoea and Demulcents.**

Achyranthes aspera.
Andropogon C., Mur., & N.
Aplotaxis auriculata.

Brassica A.
Bryophyllum calyoinum.
Calotropis gigantea.
Capsicum A.
Mucuna pruriens.
Sapindas trifoliatus.
(infantum):—
Camphora officinarum *(P.H.T.)*
Carum copticum.
Cinnamomum camphora.
Coffea A.
Cyperus R.
Euphatorium A.
*Gorochanam.*
Mentha P.
Moschus moschiferous.
(cramps):—
Cuprum acet *(P.H.T.)*
Hyoscyamus *(P.H.T.)*
Kaolin *(P.H.T.)*
Papaver somniferum.
Piper nigrum.
Podophyllum emodi *(P.H.T.)*
Potassii nitras.
Ptychotis A.
Ranwolfia S.
Serpent poison preparations.
Sinapis J.
Strychnos I.
(collapse):—
*Verbena oil.*
Zingiber O.

**54. CHOREA:—**

Hermodactylus G.
Nardostachys J.
Valeriana species.

**55. CHYLURIA:— (Pisthameha):—**

Symplocos R.

**56. CIRRHOSIS: (Yakraddalyudara; Yakrith-vriddhi).**

(Infantile).
Luffa E.
Potassium salts.

**57. COLDS: (Amadosham; Jaladosham). See also "Catarrh".**

Abies Webbiana.
*Allae pauk.*
Allium sativum.
Caryophyllus aromaticus.
Centipeda O.
Ceropegia B.
Citrus acida *(P.H.T.)*
Citrus B.
Coriandrum sativum.
Curcuma L.
Erythroxylon C.
*Ithraphal.*
Moschus moschiferous.
Piper nigrum.
Ptychotis A.
Zingiber O.

**58. COLIC: (Shula):—**
**(flatulent):—**

Achyranthes aspera.
Acorus C.
Anthemis N.
*Asphaltum (Silajit).*
Carbonate of Soda.
Caryophyllus aromaticus.
Cinnamomum tamala.
Citrullus colocynthis.
Coriandrum S.
Crocus S.
Ferula A. & F.
Fiscus Benja.
Pimpinella A.
Ruta G.
(infant):—
Alocasia I.
Aloe B.
Caryophullus aromaticus.
Coleus A.
Altingia E.

Anisomeles M.
Apium G.
Asparagus R.
Barringtonia A.
Caesalpinia B.
} (flatulent colic).

(Chronic):—
Cannabis S.
Capparis A.
Carum copticum.
Cassia F.
*Chaturushana churna.*
Clerodendron Infor.
Clitoria T.
Coriandrum sativum.
Ferula foetida.
Foeniculam V.
Galega P.
*Gandhakadi vati.*
Gendarussa V.
Glorios S.
(due to worms):—
*Grahini-mihira Taila.*
(colitis):—
Holarrhena A.
Hyoscyamus niger.
Hyssopus O.
Illicium V.
*Jatiphaladi churnam.*
*Kalyanaksharam.*
Lavendula S.
(painter's):—
Linum U.
Luffa E.
*Madanadi Vamana.*
*Mahanaracha Rasa.*
Melaleuca L.
(gastric):—
Mentha P.
Mucuna P.
Myristica F.
Nardostachys J.
Nicotiana T.
Paederia F.
Paeonia E.
Papaver S.
Peganum H.
Piper species.
Potassii carbonas and Salts.
Premna integrifolia.
Ptychotis A.
Randia D.
Ranwolfia S.
Ricinus communis.
(lead):—
Saccharum O.
Saline substances.
Sapindas T.
*Shanka bhasma.*
Sida C.
(renal):—
Siegesbeckia O. etc.
Sinapis J.
Solanum I.
*Sula gaja kesari.*
Sulphur and its preparations.
Tamarindus I.
Terminalia Cat. & Cheb.
Trigonella F.
Vitex N. etc.
Zingiber O.

**59. COMA: (Sannyasa).**
**See "Fainting".**

**60. CONCEPTION:—**
Abroma augusta *(P.H.T.)*

**61. CONJUNCTIVITIS: (Abhishyanda):—**

Aloe L.
Alumen.
Berberis asiatica.
Bombax malabaricum.
Cassia auri.
Coleus A.
Coptis T.
(chronic):—
Coriandrum S.
Emblica O.
Erythrina I.
Memecylon F.
Osepie & its preparations.

Ricinus C.
(chemosis):—
Strychnos P.
Zincum.

**62. CONSTIPATION:**
**(Anaha; Malabandham):--**
**See also "Laxatives, Purgatives".**

Acalypha I.
Acorus calamus.
Alocacia I.
Aloe barbadensis.
Bertholletia E.
Beta V.
(habitual):—
Cassia absus & O. & F. angustifolia.
Euonymus A.
Sulphur and its preparations.
Bezoar.
Fel bovis.
Clitoria T.
Emblica O.
*Gandhakadi churna.*
*Gandhaka Kalka.*
*Gulkhand.*
*Ichchavedivatica.*
(chronic):—
Ithrphal.
Strychnos N.
Jatropha Mon.
*Kalyana-ksharam.*
Lens E.
*Naracha churna.*
*Naracha Rasa.*
Papaver somniferum, (*P.H.T.*)
Picrorrhiza kurroa.
Piper species.
*Pranadi gutika.*
Psidium G.
Pyrus malus, *(P.H.T.)*
Rosebay.
(Obstinate):—
*Rukkeshee Rasa.*
Stannum preparations.
Strychnos nux-vomica.
Tamarindus I.
Taraxacum *(P.H.T.)*
*Trivrit Leyham.*
*Tumburadya Churna.*

**63. CONSUMPTION:**
**(Kshyaya; Rajayakshma).**
**See also "Pleurisy" and Expectorants)**
**See also "Phthisis" Tuberculosis.**

Abies Webbiana.
*Abhra Bhasma.*
Adhatoda vasika.
*Agasti-haritaki.*
Allium sativum.
Balsamodendron mukul.
Bambusa arundinacea (Bamboo manna).
Beninkasa C.
*Dhanvantri tailam.*
*Draksharista.*
Emblic myrobalan.
Hemidesmus indicus.
Hydnocarpus wightiana.
Ipomoea digitata & I. turpethum.
*Kumari asava.*
*Lakshadi Taila.*
Mel depuratum.
Myrtus communis *(P.H.T.)*
*Narayana Taila.*
*Narikelakhanda.*
*(pulmonary):—*
Papaver somniferum.
Pinus deodara.
Piper longum.
Squalus C./preparations.
Tinospora cordifolia.
Vitis V.
Withania S. etc.

**64. CONTUSIONS:—**
**(See:—Inflammations & Antiphlogistics).**

Aplotaxis auriculata.
Cera flava.

**65. CONVALESCENCE:—**
Quinetum.
Sida A.
Toddalia A. etc.

**66. CONVULSIONS: (Aakshepaka; Apasmaram):—**
(Infantile):—
Allium C. & S.
Cassia O.
Ferula foetida.
Ruta G.
(puerperal):—
Gardenia F.
*Gorochanam.*
Gynandropsis P.
*Masha Taila.*
Nardostachys J.
*Ovapana.*
Sinapis J.
*Svalparasuna Pinda.*

**67. CORNS: (Kadara; Keelakam):—**
Anacardium O.
Carica P.
Jasminum G.
Oxalis C.
(Inveterate):—
Urgina I. etc.

**68. CORPULENCE: (Sthulata):— See also:—"Obesity".**
Aplotaxis auriculata.
Boswellia glabra *(P.H.T.)*
Crataeva N.
Dolichos Bif.
Gardenia G.
Mel depuratum.
*Silajit.*
*Varunadya Guda.*

**69. CORYZA: (Pratishyaya; Jaladosham):—**
*Chaturushana Churnam.*
Curcuma L.
Eucalyptus G.
Euphorbia P.
Myristica M.

**70. COUGH: (Kasa):— (See also: "Expectorants"**
Abies W.
Abrus precatorius.
Acacia Arabica.
Aconitum heterophyllum.
Acorus calamus.
Adhatoda V.
*Allae pauk.*
Allium C.
Aloe barbadensis.
Alpinia officinarum.
Alumen.
Anisochilus C.
Aplotaxis auriculata.

(for chronic):
Balsamodendron O.
Bambusa arundinacea.
Coleus A.
Myrica N.
*Ovapana.*
Solanum T.
Trigonella F.

Beninkasa C.
Cervus dama.
*Chaturushana Churnam.*
Cinnamomum C. I. M. & T.
Cochlospermum G.
Coriandrum sativum.
*Cowrie bhasma.*
*Dhatrimodaka.*
*Draksharista.*
Ferula foetida.
Galega P.
Gendurussa V.
Glycyrrhiza G.
Herpestis monniera.
Hibiscus Rosa S.
*Hrasva panchamula.*
(Spasmodic):—
Hyoscyamus N.
Illicium verum.
*Jatiphaladya Churna.*

*Kapha ketu Rasa.*
Nicotina T.
Polyporus O.
Solanum I. & X.
Squalus C. preparations.
Styrax B.
Hyssopus O.
Indigofera Pul.
*Kantakaryava Leha.*
*Katphaladi Churna.*
*Lavangadi Churnam.*
*Mukta Bhasma.*
Myristica M.
*Panchakola Churnam.*
Papaver S.
Piper species.
*Pippali Arista.*
Rhus succedanea.
Saussurea L.
Scilla I.
(phlegmatic):—
Scindapsus O.
Semecarpus anacardium.
Sesamum indicum.
Sinapis J.
Solanum N.
Solanum Xanthocarpum.
*Sringyadi Churna.*
Tylophora A.
(distressing):—
Styrax B.
Sulphur and its preparations.
*Talisadya Churna.*
Tamarix G. etc.
Terminalia B. & Cheb.
*Vasava Leha.*
Verbascum T.
Viola species.
Vitis V.
Zingiber O. & Z.

**71. CRACKS IN HANDS:—**
Calendula Officinalis *(P.H.T.)*

**71(a) CRAMPS:—**
**See: Tailors' cramp and writers' cramp.**

**72. CROUP: (Svaragneekasa; Swarabhangam; Swaraghna).**

Aristolochia indica.
Carica P.
Cinnamomum zeylanicum.
Eucalyptus G.
Ocimum basilicum.
(Spasmodic):—
Kaolin *(P.H.T.)*
Urgina I.

**73. CYSTITIS: (Mutrouka-sada; Moothrakrichram):— (See also: "Diuretics").**

Abutilon I.
Acacia A.
Aconitum nepellus *(P.H.T.)*
Andropogon muricatus.
Cannabis sativa *(P.H.T.)*
Cantharis *(P.H.T.)*

Cissampelos pareira.
Corchorus C.
Cyperus rotundus.
Santalum A.
} (for chronic)

Erigeron C.
Eucalyptus G.
(Catarrh of bladder):—
Gmelina A.
Hemidesmus indicus.
Hibiscus Rosa S.
Linum U.
Liquidambar O.
Mollugo cerviana.
Phaseolus species.
Sida C.
Tribulus T.
(spasm of bladder):—
Vernonia C. etc.
Zincum.

**74. DANDRUFF:— (Sirakandoo):—**

Canabis S. or C. I.
Citrus B.

Euphorbia T.
Indigofera A.

**75. DEBILITY: (Asaktata; Balakshyam; Kshina-Roga).**
**See also "Tonics", "Aphrodisiacs".**

Aconitum H.
*Agnithundi vati.*
*Asvagandha ghrita.*
Alstonia S.
Andrographis paniculata.
*Banga Bhasma.*
Curculigo O. (for old age).
Emblica O.
Evolvulus A.
(nervous):—
Hibiscus A. & S.
*Makaradhvaja.*
Trapa B. etc.
(constitutional):—
*Chyavanaprasha.*
Ipomoea digitata.
*Kameshwar modak.*
Kariyat.
Lepidium S.
*Mahalakshmibilas Rasa.*
*Majoonai-kuvathiabah.*
*Mandura Loha.*
Melia Azadi.
Myristica M.
Phoenix species.
Soymida F.
Toddalia A.
Trapa B.
Tribulus terrestris.
*Vasanta Kusumakara Rasa.*
Withania S. etc.

**76. DELIRIUM: (Vibhrama):—**

Agaricus *(P.H.T.)*
Camphora O.
Capsicum frutescens & minimum.
Lagenaria V.
Michelia C.
Myristica F.
(violent):—
Papaver S.
Potassium salts.
Sinapis J.
Zizyphus J. etc.

**77. DIABETES MELLITUS & INSIPIDUS:—**

*(Madhu-meha)*
*(Udak-meha).*
Abroma augusta *(P.H.T.)*
Acacia A.
Aconitum F.
Alpinia G.
*Bangeshwara Rasa.*
*Basanta Kusumakara Rasa.*
*Brihat Kasturi Bhairub.*
*Brihat Samanatha Rasa.*
Cassia Auri.
Cassia F.
Cassia S.
Cephalandra indica.
Citrus A.
Curcuma longa.
Cyperus Rotundus.
Emblica O.
Emblic myrobalan.
Eriodendron A.
Erythrina I.
Eugenia J.
Ficus G. & B.
*Ganganadhi Lauha.*
Guazuma T.
Gymnema S.—a specific.
Helicteres I.
Ipomoea digitata.
*Kadalyadi ghrita.*
Lodoicea S.
Mengifera I.
Mel depuratum.
Momordica charantia *(P.H.T.)*
Musa Paradisica & Musa S.
Nymphoea species.
Orchis M.
Papaver S.

Phyllanthus species.
Plumbum *(P.H.T.)*
Pongamia G.
Prunus Amygdalus.
Psidium G.
Rourea S.
Rubia cordifolia.
*Sattgilo or Palo.*
Scilla indica *(P.H.T.)*
*Somanatha Rasa.*
Stannum preparations.
Strychnos N. & P.
Syzygium jambulanum *(P.H.T.)*
*Tarakeshvara Rasa.*
Terminalia chebula.
Tinospora cordifolia.
*Triphala.*
Valeriana for diabetes insipidis *(P.H.T.)*
*Vangeshvara Rasa.*
*Vasanta Kusumakara Rasa.*
*Vitis vinifera.*
*Vrihat Vangeshvara Rasa.*
Yeast, extract of *(P.H.T.)*

**78. DIARRHOEA:**
**(Atisara):—**

Acacia A. C. & S.
Achyranthes aspera.
Aconitum heterophyllum.
Acorus calamus.
*Agnikumara Rasa.*
(chronic):—
Aegle M.
Alstonia S.
*Ananda Bhairava Rasa.*
Arsenious acid.
Asphaltum *(Silajit).*
*Bhoonimbadi Churnam.*
Bombax malabaricum.
Cannabis S.
Carica P.
Coffea A.
Cuminum cyminum.
Cynodon D.
Eugenia J.
Ferri sulphas.
Galiga P.
*Gangadhara Churna (laghu & brihat).*
Garcinia M.
*Grahani kapata Rasa.*
Hemidesmus indicus.
*Mahagandhak.*
Myristica fragrans.
Orchis M.
Papaver somniferum.
Plumbum and its salts.
Punica G.
*Rasanjanadi churna.*
Santalum album.
Strychnos P.
*Swarna parpati.*
Terminalia cheb.
Vitis V.
(Ordinary):—
Agaricus A. & O.
Amaranthus Poly.
Annona R. & S.
Areca C.
*Bael marmalade.*
*Balachaturbhadraka.*
Barringtonia A.
Bauhinia V.
Butea F.
Caesalpinia D. & S.
Cedrus D.
*Changeri ghrita.*
Cinnamomum C. M. T. & Zeylanicum.
Cissampelos pareira.
Cylesta S.
Cyperus P. & R.
Diospyros E.
*Dugdhvati.*
Elephantopus S.
Emblica O.
Feronia F.
Flacourtia C.
(acute & *chronic):— (Pakwa-atisar).*
Holarrahena A.
*Vajrakapata Rasa.*

*Hriveradi.*
*Isaphgul-ka-chilka.*
Ixora C.
*Jatiphaladi gutika.*
Jatropha C.
*Jawarish-a-kammon.*
*Jirakadi Modaka.*
Kalanchoe L.
*Kalu Bhasma.*
*Kapithashtaka Churna.*
*Karpura Rasa.*
*Kutajarishta.*
*Kutajashtaka.*
Lepidium S.
Mangifera I.
Musa S.
(summer & choleraic):—
Myristica F.
Myrtus C.
Nigella S.
Nymphoea species.
Ostrea E. & its preparations.
Paederia foetida.
Poenia F.
Papaver S.
Parmelia P.
Physalis species.
Plantago ispagula.
Pongamia G.
Pterocarpus M.
Ptychotis A.
Quercus I.
Randia D.
(also teething):—
Rheum E.
(infantile):—
*(Balároga-atisar)*.
Rhus S.
Ricinus C.
(with high fever):—
*Sambunath Rasa.*
Sindapsus O.
Sesbania species.
*Shankhavati.*
Shorea R.
*Shulaharanayoga.*
Silicium salts.
Sodium salts and preparations.
Soymida F.
Spongia O.
(atonic):—
Strychnos N.
Terminalia B. C. & T.
Tabernamontana species.
Tamarix G. etc.
Terminalia A. & B.
Toddalia A. etc.
Trapa B. etc.
(puerperal):—
Trigonella F.
Tylophora A.
Urine (Ox's).
Vitex N. etc.
Woodfordia F.
Zincum.
Zingiber O.
Zizyphus J. etc.

**79. DIPHTHERIA: (Kantharohini):—**

Capsicum A.
Citrus limonum *(P.H.T.)*
Eucalyptus G.
Mentha P.
Sodium salts and preparations.

**80. DIPSOMANIA: (Oonmada):—**

Capsicum A.
Coriandrum S.
Ptychotis A.
Zinc salts and preparations.

**81. DROPSY: (Sotham; Shoafa Shwayathu; Udaram-Sopham); (Shotha); (See also "Diuretics" & 'Liver affections" & 'Purgatives' "Stomach complaints") (Shoparaga).**

*(Svayathu):—*
Achyranthus A.
*Adityapaka guggula.*

Aegle M.
Allium sativum.
*Amrita guggula.*
Argemone M.
Asparagus O.
Azina T.
Balsamodendron Mukul.
Bauhinia V.
Blatta Orientalis *(P.H.T.)*
Boerhavia diffusa *(P.H.T.)* & repens.
Calotropis gigantea.
Citrullus colocynthis.
Cocculus C.
Croton T.
Euonymus.
Euphorbia N.
(hepatic):—
Galega P.
Helleborus N.
Hermodactylus G.
Hygrophila S.
Indigofera Tinct.
Ipomoeah H. P. & T.
*Jalodarari Rasa.*
Juniperus C.
*Kaisara guggula.*
*Kanchanara guggula.*
*Lokanatha Rasa.*
Moringa P.
Mucuna P.
Nigella S.
(renal):—
Pavetta I.
Picrorhiza Kurrooa.
Piper nigrum.
*Punarnavadi mandur.*
Rubia C.
*Sadanga guggula.*
Scilla I.
Urgina I.
(anaemia):—
*Shoathahar Loha.*
Solanum Xanthocarpum & nigrum.
Sterospermum suaveolens.
Strychnos I.
Symplocos R. etc.
Taraxacum O. etc.
Terminalia B.
Tribulus terrestris.
Trigonella F.
*Triphala guggula.*
(cardiac):—
Urgina I. etc.
*Vahni Rasa.*
*Vatari Rasa.*
Vernonia C. etc.
*Yogaraja guggula.*
Zingiber Officinale.

**82. DYSENTERY: (Aamatisara; Athisara; Aamansha; Aavartaka; Pravahika):— (See also : "Demulcents" & "Digestives"):—**

Acacia A. & C.
Acorus calamus.
Adhatoda V.
(chronic):—
Aegle M.
Agaricus O.
Ailanthus glandulosa *(P.H.T.)*
Ailanthus M.
Allium C.
Aloe L.
Alstonia S.
Alumen.
Anona S.
Asclepias A. & C.
Asparagus A.
*Bael marmalade.*
Balsamodendron O.
Bambusa arundinacea (Bamboo manna).
Bauhinia T. & V.
*Bhoonimbadi Churnam.*
*Bilva Panchaka.*
Bixa O.
Bombax malabaricum.
Butea F.
Caesalpinia S.
Calotropis gigantea.
Cannabis S

Careya A.
Cinnamomum tamala & zeylanicum.
Cuminum cyminum.
Cyperus rotundus.
Diospyros E.
Eucalyptus G.
Eugenia J.
Ferri sulphas.
Musa S.
Orchis M.
Pterocarpus species.
Rheum E.
Rumex C.
*Shankavati.*
Sida C.
Strychnos N.
Sulphur and its preparations.
(chronic, infantile):—
Cedrela T.
Cedrus D.
*Changeri ghrita.*
Citrus B. & M.
Coccus lacca.
Cochlospermum G.
(acute):—
Corchorus C.
Curcuma Ang.
Cylesta S.
Cynodon D.
Cyperus P. & R.
Diospyros M.
Elephantopus S.
Emblica O.
Eriodendron A.
Etrythrina I.
Euphorbia P.
Evovulus A.
Feronia E.
Ficus B. & C.
Flacourtia C.
Flemingia T.
*Gangadhar Rasa.*
*Gangadhara Churna (Laghu & Brihat).*
Garcinia M. & Pur.
Geranium W.
Gossypium I., R. & H.
Gracilaria L.
*Grahani-kapata Rasa.*
Grewia P.
Hermodactylus G.
Hibiscus P.
Holarrhena A.
Hydrocotyle A.
*Isaphagal-ka-chilka.*
Ixora C.
*Jatiphaladi gutika.*
Kalanchoe L.
*Kapithashtaka Churna.*
*Kutaja Leha.*
*Kutajarishta.*
*Kutajastaka.*
Litsea S.
Luffa Am.
Symplecos R.
(bleeding):—
Mangifera I.
Mesua F.
Musa paradisiaca.
(typhoid):—
Myrica N.
Myristica fragrans.
Myrtus C.
Nelumbium S.
Ochrocarpus L.
Ocimum species.
Oleum Ricini.
Oxalis C. *(P.H.T.)*
Papaver S.
Parmelia P.
*Patadya Churna.*
Phyllanthus species.
Physalis species.
Piper nigrum.
Plantago ispagula (seeds) & ovata.
Potassium salts.
*Prituka Churna.*
Punica G.
Pyrus species.
Randia D.
Saccharum O.
Saline substances.

Santalum A.
Saraca I.
Sesamum I.
*Shankha Bhasma.*
Shorea R.
Silicium salts.
Soymida F.
Spondias M. etc.
Spongia O.
Tamarindus I.
Tamarix G. etc.
Terminalia A. & B.
(mucous stools):—
Terminalia cheb.
Trigonella F.
Tylophora A.
*Vajrakapata Rasa.*
Woodfordia F.

**83. DYSMENORRHOEA: (Asrigdhara; Arthavasoolam).**

Abroma A.
Borax *(P.H.T.)*
Brassica A. & J.
Cannabis S.
Cocculus *(P.H.T.)*
Crocus S.
Datura A. & F.
Erythrina I.
Gossypium I. & H.
*Jatiphaladi Churnam.*
Melanleuca L.
Musa S.
Myristica F.
Semecarpus A.
Sesamum I.
(and after pains):—
Viburnam F.

**84. DYSPEPSIA: (Agnimandya; Amlapitta). (See also: "Flatulence" & "Indigestion").**

*Abhra Bhasma.*
Aconitum H.
Acorus C.
*Agnimukha Churna.*
Ailanthus Ex. & M.
*Allaepauk.*
Alstonia scholaris.
Amorphophallus C.
(with loss of appetite):—
*Amlica pana.*
*Amrita Haritaki.*
*Amrita Kalpa Rasa.*
*Amrita Vati.*
*Ananda-Bhairava Rasa.*
Andrographis paniculata.
Andropogon M.
Arsenicum white.
*Bhoonimbadi Churnam.*
*Tankanadi Vati.*
(Ordinary):—
Anisomeles M.
Anthemis N.
Artemesia A.
Asparagus R.
*Astachurnam.*
*Balachaturbhadraka.*
Beninkasa C.
Bile.
*Brihat Suran Madaka.*
Calotropis gigantea.
Capsicum A., F. & M.
Carbonate of Soda.
Carica P.
Carum copticum.
Cassia fistula.
Cinchona C.
Cinnamomum C. & I.
(atonic):—
Citrus Au. & M.
Coptis T.
Elettaria C.
Feronia elephantum.
Ferula foetida.
Hibiscus A.
Lycopersicum E.
Rheum E.
Terminalia cheb.
(bilious):—
Cocculus V.
Gentiana K.

Spondias M. etc.
(Ordinary):—
Coriandrum S.
Cosmostigma R.
*Cowrie Bhasma.*
*Dhananidala.*
*Dhatri arista.*
*Dhatri leha or lauha.*
*Dhatrimodaka.*
*Drakshasava.*
Embelia R.
Emblica O.
Ferula foetida.
Galega P.
Grangea M.
*Guda or guda manduram.*
Hedychium S.
Hemidesmus I.
Hibiscus S.
*Hingavashtaka Churna.*
*Hriveradi.*
Hyssopus O.
Jatropha C.
*Jawarish-ai-kammon.*
*Jirakadi Modaka.*
(anorexia):—
*Kalpam kalyana-ksharam.*
*Kapardaka Bhasma.*
Lactuca S .
*Laghu Surana Madaka.*
*Laja.*
*Lauha Bhasma.*
Mesua F.
*Methi Modaka.*
Michelia C.
Mucuna P.
Myristica F. & M.
Nigella S.
*Narasimha Churna.*
*Narikelakhanda.*
*Narikelakshara.*
Nymphoea species.
Oryza S.
Ostrea E. and its preparations.
Oxalis C.
*Panchakola Churnam.*
Parmelia P.
Picrorrhiza Kurroa.
Piper species.
*Pittantaka Rasa.*
Plumbago Zeylanica & R.
Pongamia G.
*Pranadi gutika.*
*Pravala Bhasma.*
Ptychotis A.
Punica granatum *(P.H.T.)*
Pyrus species.
Quassia E.
Rumex C.
Saline substances.
*Samasarkara Churna.*
*Sambuka Bhasma.*
*Saubhagya Sunti.*
Saussurea L.
Semecarpus A.
*Shanka Bhasma.*
*Shilajit.*
*Sida A.*
Sodii B.
(painful):—
*Bhaskara Lavanam.*
*Brishta tandula.*
*Shoolaharanayoga.*
Sodium salts & preparations.
Urine (Cow's) & preparations.
Stannum preparations.
Strychnos C. & N. *(P.H.T.)*
*Sukti Bhasma.*
Sulphur & its preparations.
Sulphur corrected with Myrobalans *churna.*
*Svalpa methi modaka.*
Swertia C. etc.
Taraxacum O.
Terminalia B.
Tinospora cordifolia.
Trigonella F.
*Trivrit Leyham.*
*Tryushanadi Lauha.*
(with flatulence):—
*Tumburadya Churna.*
*Vanga Bhasma.*
Vitex N. etc.
(acid):—

*Vidyadharabhra.*
Vitis V.
Xanthoxylum species.
Zingiber officinale.

**85. DYSPNOEA: (Hikka-Swasam). See:—Hiccough.**

Aloe B.
Andropogon C.
Eucalyptus G.
*Kumari Asava.*
Melanleuca L.
Sinapis J.
Terminalia B.
(emphysematous):—
Withania S.

**86. DYSURIA: (Mutrakrachha; Mootrakrichram):— See also: Strangury. See: Diuretics and Antispasmodics).**

Abelmoschus E.
Asparagus racemosus.
Bombax M.
Cannabis S.
Clitoria T.
Corchorus C.
Curcuma Ang.
Cynodon dactylon.
Elephantopus S.
Erythrina I.
Glycyrrhiza G.
Gmelina Asi.
*Gokshuradi guggula.*
Hibiscus S.
Hygrophila S.
Ipomoea digitata.
Potassii Carbonas.
Scilla I.
Solanum 1. & Xanthacarpum.
*Sweta parpati.*
Tribulus territris.
Vitis vinifera.

**87. EAR-ACHE: (Karnashoola:— See also: "Antiseptics"; "Tympanitis").**

Acacia catechu.
Allium S.
Alstonia S.
*Apamarga taila.*
Caésalpinia bonducella.
Cardiospermum H.
Cleome V.
Conium maculatum *(P.H.T.)*
Crinum D.
Datura A.
Erythrina I.
Euphorbia Tir.
Ferula foetida.
Grangea M.
Hirudo medicinalis.
Jasminum G.
Moringa pterygosperma.
Musa paradisiaca.
Myrica sapida.
Myristica M.
Ocimum species.
Pandanus O.
Papaver S.
Papaver nigrum *(P.H.T.)*
Piper species.
Ptychotis A.
*Shankha Bhasma.*
Spondias M. etc.
(with discharges):—
Squalus C. preparations.
(tympanitis):—
Sulphur & its preparations.
(also with sores):—
Trichosanthes species.

**88. ECLAMPSIA:—Cobra poison (P.H.T.)**

**89. ECZEMA: (Kanda; Kitibha):—**

*Adityapaka taila.*
Amaranthus Poly.
*Arka taila.*

Arsenicum white.
Butea frondosa.
Calotropis G.
Cassia alata & tora.
Cera flava.
Citrus Au.
Cocculus V.
Cucumis Melo.
Curcuma L.
Ghee.
Graphites (black lead) *(P.H.T.)*
Gynocardia odorata.
Hemidesmus indicus.
Hydrocotyle A.
Jatropha C.
*Jirakadya taila.*
*Karaviradya taila.*
Melaleuca S.
*Panchavalkadi tailum.*
Piper nigrum.
Rubia cordifolia.
Santalum album.
*Sinduradya taila.*
(tetter):—
Triticum S.
Zinc salts and preparations.

**90. ELEPHANTIASIS: (Sleepaada; Slipada):— See: "Filariasis": (See: Antiyretics; Blood-purifiers; Diuretics and Purgatives).**

Allium sativum.
Calotropis gigantea.
Curcuma longa.
Datura fastuosa.
Eclipta E.
Guazuma T.
Hemidesmus I.
(for fever):—
*Hubbai Sahfa.*
Hydrargyrum.
Hydrocotyle A.
Ichnocarpus F.
Indigofera A.
Mucuna P.
Picrorrhiza kurroa.
Piper nigrum.
Sida C.
Symplocos rasemosa.

**91. EMPHYSEMA:—**

*Punarnavashtaka.*
Strychnos N.
Urgina I. etc.

**92. ENTERITIS:— See: "Typhoid" fever.**

**93. ENURESIS:— See: Anuria & Urinary complaints.**

**94. EPIDIDYMITIS:— (Gonorrhoel):—**

Vitex N. etc.

**95. EPILEPSY: (Apasmara):—**

Acorus C.
Adhatoda V.
Allium C.
Anacyclus P.
Aplotaxis auriculata.
Artemesia absinthium *(P.H.T.*
Asparagus racemosus.
Beninkasa C.
Borax *(P.H.T.)*
*Brahmi ghrita.*
Brassica A.
Camphora O.
Canscora D.
*Chaturmukha Rasa.*
Clerodendron siphonanthus.
(nocturnal):—
Cocculus S.
Cow's urine.
Datura A.
Execaria A.
Flemingia S.
Gossypium I.
Hemidesmus indicus.
Hermodactylus C.

Herpestis M.
Hydrocotyle asiatica.
Hyocyamus N.
Indigo tinctoria *(P.H.T.)*
*Kumari Asava.*
*Kushmanda Ghrita.*
Lycopodium C.
Moringa P.
(hystero):—
Nardostachys J.
*Ovapana.*
Paeonia E.
Pandanus O.
Peteroselinum S.
Plumbum and its salts.
Sapindas T.
Semecarpus A.
*Siddhartha Ghrita.*
Smilax C. etc.
Sodium salts and preparations.
Sulphur and its preparations.
Trichosanthes species.
Urine (Goat's) preparations.
Valeriana species.
(locally):—
*Vasachandanadi Taila.*

**96. EXPISTAXIS:—**
**(Nasarakta; Raktapitta; Urdhwagata):—**
**See also:—Demulcents & Diuretics.)**

Acacia catechu.
Achyranthes aspera.
Allium cepa.
Alumen.
Alum water *(P.H.T.)*
*Apamarga Taila.*
Crotalaria J.
Cynodon D.
Dalbergia Sis.
Emblica O.
Gossypium I.
Moschus moschiferous *(P.H.T.)*
Punica granatum.
Rhus S.
Saccharum officinarum.

Silicium salts.
Triticum S.
Vitis Q. etc.

**97. ERYSIPELAS:**
**(Visarpa):—**
**See also:—"Fevers".**

Aconitum napellus *(P.H.T.)*
Berberis aristata.
Eucalyptus G.
Indigofera A.
*Kalagnirudra Rasa.*
Melia azadirachta.
Portulaca species.
*Tribhuvankeerti Rasa.*
Triticum S.

**98. ERYTHEMA:—**
Coriandrum S.

**99. EYE DISEASES:—**
**(Netraroga):—**
**See also:—"Antiseptics" & "Anti-phlogistics".**

Acacia S.
Agaricus *(P.H.T.)*
Boerhavia diffusa.
Borax.
Butea frondosa.
Cinnamomum camphora. (Pacchakarpurum).
Conium maculatum in muscular weakness *(P.H.T.)*
Curcuma longa.
Datura fastuosa.
Digitalis purpurea in Blapharitis. *(P.H.T.).*
(Tinia tarsi):—
Erythrina I.
Ghee.
(sore):—
Heliotropium S.
Hydnocarpus inebrians.
Ipecac *(P.H.T.).*
Ipomoea turpethum.
Peteroselinum S.
(weak eyes):—

Jasmin G. & S.
Mel depuratum.
Musa S.
Oleum Ricini.
Papaver somniferum.
(painful eyes):—
Piper species.
Plumbum and its species.
Polygala senega *(P.H.T.)*.
Rhododendron *(P.H.T.)*.
Rosa species.
(country sore):—
Saccharum O.
Saxifraga L.
Sesamum I.
Smilax China.
Strychnos nux-vomica in atrophy of retina *(P.H.T.)*.
(Lachrymation):—
Strychnos P.
Symplocos R.
Terminalia chebula.
(blood shot eyes):—
Vernonia C. etc.
Zinc salts and preprations.

**100. FAINTING: (Moorchha; Murchcha; Bhramanidra):—See also Syncope and "Coma".**

Allium C. & S.
Anona S.
Moringa P.
Nicotina T.
Phaseolus nana. *(P.H.T.)*.
Zingiber O.

**101. FATIGUE: (from long journeys):—**

Coffea Arabica *(P.H.T.)*.
(for mental fatigue):—
Anacardium *(P.H.T.)*.

**102. FELONS:—See "Sores"; "Wounds", etc.**

Euphorbia A.

**103. FEVERS: (Jvara): (See also "Diaphoretics", Diuretics, & "Purgatives").**

Aconitum F. H. & N.
Acorus C.
Bambusa arundinacea.
Cinnamomum camphora.
Coriandrum sativum.
Cuminum cyminum.
Datura fastuosa.
Hydrargyri sulphidum rubrum.
Ipomoea turpethum.
Piper nigrum.
(eruptive):—
Agati Gr.
*Bisamajaranthak Lauha*.
Oryza S.
Piper longum.
Potassium salts.
Premna integrifolia.
(Quartan fever):—
Achyranthes aspera.
(Catarrhal fevers):—
Aegle marmelos.
Ocimum sanctum.
Rhus succedanea.
(after effects):—
Alstonia S.
(intermittent & remittent):—
*Ananda Bhairava Rasa*.
Andrographis P.
Andropogon M.
Anisomeles M.
Clerodendron Inerme.
(Miasmatic fever):—
Berberis asiatica & B. aristata
Coccus lacca.
Calotropis G.
(intermittent):—
*(Vishama-jwara)*.
Aristolochia I.
Boerhawa diffusa.
Calotropis G.
*Brahat Sudarshana Churna*.
Carum carui.
Cassia fistula.

Cinchona C.
Gentiana K.
Gmelina arborea.
Gossypium I.
Hemidesmus indicus.
Melia Azadirachta.
*Mukta bhasma.*
Nigella S.
Nyctanthes arbor-tristis.
Pterocarpus santalinus.
Quinetum.
Quinine.
Soymida F.
Strychnos N.
*Taruna Jvarari.*
Vitex T.
Zingiber O.
(with delirium etc.):—
*Ashtadasanga pachana.*
(chronic fever with emaciation and anaemia):—
Andrographis paniculata.
Berberis A.
Bixa O.
Caesalpinia B.
Camphora O.
*Kiratadi Taila.*
(rheumatic & inflammatory):—
Cassia S.
Cocculus C.
(chronic):—
Cyperus R.
*Dasamula Kvatha.*
Dichrosa F.
Eucalyptus G. *(P.H.T.).*
Gendarussa V.
*Jvarabrahmastra.*
*Jvarasani Rasa.*
Moschus moschiferus.
Punica G.
Pyrethrum radix.
*Sattgilo or Palo.*
Sida cordfolia.
Solanum I.
*Sri. Mrityunjaya Rasa.*
Sterospermum suaveolens.
*Sudarsana Churna.*
Sulphur and its preparations.
*Swasa Kutara Rasa.*
*Visamajvarantaka Lauha.*
Zinc salts and preparations.
Coffea Arabica for early stages of typhoid fever. *(P.H.T.).*
(rheumatic):—
Asparagus racemosus.
(bilious):—
Adhatoda Vasica.
Cyperus rotundus.
Glycyrrhiza G.
Mollugo cerviana.
Podophyllum E.
Quassia E.
Solanum Xanthocarpum.
Tinospora cordifolia.
*Trubhuvan-keerti Rasa.*
Trichosanthes species.
*Vetala Rasa.*
Vitis V.
*Vrihat Panchamula.*
(remittent):—
*(Vishamajvara); Jwara-Santata).*
Andrographis paniculata.
*Chandesvara Rasa.*
*Darubrahma Rasa.*
Glycyrrhiza glabra.
Gmelina A.
Hedysarum G.
*Hinguleshvara Rasa.*
Melia azadirachta.
*Panchabhadra.*
Piper Nigrum.
*Svasakuthara Rasa.*
Toddalia A. etc.
(drink):—
Andropogon muricatus.
Hordeum V.
Vitis Vinifera.
(catarrhal):—
*Hrasva Panchamula.*
Hydrocotyle A.
Indigofera E.
*Jayamangala Rasa.*

*Jwaramurari Rasa.*
Rhus S.
Vitex N. etc.
(with liver derangement):—
*Kalingakadi kvatha.*
*Kapha Ketu Rasa.*
(low):—
Balsamodendron Mukul.
Eclipta erecta.
Melanleuca L.
Nyctanthes A.
Ocimum species.
*Panchavaktra Rasa.*
*Patoladi kvatha.*
Picrorhiza kurrooa.
Piper longum.
Salvadora species.
(ague):—
Quinine.
*Ramabana-Rasa.*
Santalum A.
*Saubhagya Vati.*
Semecarpus A.
*Shadanga Paniya.*
Sida cordifolia.
Solanum N.
Spinacea O.
*Suchikavaran Rasa.*
*Svalpa Kasturi Bhairava.*
*Swachhchhanda Bhairava Rasa.*
*Swalpa-Kasturi Bhairava Rasa.*
Symplocos R.
Terminalia Cheb.
Tinospora cordifolia.
*Udaka Manjari Rasa*, for bilious remittent fever.
Urtica urens. *(P.H.T.)*.
Vernonia C. etc.
(puerperal):—*(Sutika-jwara)*:—
Vitex N. etc.
(Haemoglobinuric):—
Vitex P.
Xanthoxylum species.

**104. FILARIASIS:— See:— Elephantiasis.**

*Hubbai Sahfa.*
Rosebay.
Symplocos R.

**105. FISSURES:—See "Wounds" etc.**

Garcinia P
(Cracks of feet):—
Mangifera I.
Sodium salts and preparations.

**106. FISTULA:— (Bhagandara):—**

(anal):—
Calotropis G.
Ficus R.
Hibiscus P.
Mimosa P.

**106. (a) :—FITS:— See:— Epilepsy; Convulsions;**

**107. FLATULENCE:—(See also:—"Dyspepsia" & "Indigestion"):—**

Acorus calamus.
*Ajamodadi Churna.*
Allium S.
Andropogon N.
Apium G.
Carum copticum, & carui.
Caryophyllus aromaticus.
*Chaturushana Churnam.*
Cinnamomum C. & I.
Curcuma L. & C. & Z.
Cuscuta R.
Elatteria cardamomum.
Embelia R.
Ferula A.
(with colic):—
Ficus Benja.
Foeniculam V.
*Gudashataka.*
*Hinguvashtaka Churna.*
Hyssopus O.

Illicium V.
Jatropha Mon.
Melanleuca L.
Nardotachys J.
*Pancha-kola Churnam.*
Piper nigrum.
Pongamia G.
*Pranada gudika.*
Ptychotis A.
Saline substances.
*Shaddharana Yoga.*
Sodium salts and preparations.
Solanum I, & X.
Terminalia cheb.
Trigonella F.
*Trivrit leyham.*
*Tumburadya Churna.*
Zingiber O.

**108. FOREIGN-BODY:—
(In stomach, eyes, and ears):—**

Ricinus C.
(in eyes):—
Saccharum O.

**109. FRACTURES:—
(Asthibhagna):—**

Terminalia A. etc.
Vitis Q. etc.

**110. GALL-STONE:—**

Berberis Vulgaris *(P.H.T.)*.
(For Gall-stone colic):—
Hydrastis canadensis *(P.H.T.)*.
Pure Olive Oil *(P.H.T.)*.

**111. GASTRALGIA:—**

*Bhaskara Lavanam.*
Bismuth *(P.H.T.)*.
Pterocarpus species.

**112. GASTRITIS:—
(Gulman):—**

(chronic):—
*Bhaskara Lavanam.*
Michelia C.
Peucedanum species.
Pimpinella A.
Piper species.
Plantago I.
Plumbago species.
Raphanus S.
Semecarpus A.

**113. GASTRODYNIA:
(ANNADRAVASULA):—**

Raphanus S.

**115. GENITO-URINARY DISEASES:—**

Acacia A.
Cucumis U.
Hemidesmus I.
Hibiscus Rosa S.
Hygrophila S.
Ocimum species.
Papaver S.
Phonix species.
Phyllanthus species.
Plantago I.
(discharges):—
Plumbum and its salts.
(Superficial excoriations of genital organs):—
Pterocarpus species.
(distressive irritation of genital organs):—
Sodium salts and preparations.
(vaginal discharges):—
Sodium salts and preparations.
Stannum preparations.
Tribulus T.
Vitis V.

**116. GLANDULAR DISEASES AND INFLAMMATION:—(Grandhirogam).**

Balsamodendron Mukul.
Cupri sulphas.
Moringa P.
Papaver S.
Pinus deodara.

Silicium salts.
(lymphatic and secreting):—
Potassium salts.
Sodium salts, and preparations.
Sphacranthus H.
Strychnos N.
Vitex N. etc.
Withania S. etc.
(suppurating):—
Squalus C. preparations.

**117. GLEET: (See also:—"Cystitis", "Gonorrhoea" & "Diuretics"):—**

Aegle marmelos.
Asparagus A.
Asphaltum (Silajit).
Balsamodendron Mukul & O.
Canarium C.
Cimicifuga racemosa (*P.H.T.*)
Cubeba O.
Cynodon D.
Dipterocarpus T.
Garcinia M.
Geranium W.
Myrica N.
Pinus species.
Piper nigrum.
Quercus I.
Rhus S.
Santalum A.
Sida R.
Stannum preparations.
*Swarna vangam.*
Tribulus T.
*Vasantakusumakara Rasa.*
Xanthium S. etc.
*Yogaraja guggula.*

**118. GLOTTIS, SPASM OF:—**

Corallium rubrum.
Cuprum, (*P.H.T.*)
Moschus.

**119. GOITRE: (Galaganda):—**

Egg shells (*P.H.T.*)
Gracilaria L.
Laminaria S.
Sphaeranthus H.

**120. GONORRHOEA: (Sukra; Pooyamcham; Puyameha): (Oupsargik-meha): (See also:—"Gleet"):—**

Abelmoschus E.
*Abhra Bhasma,* with honey, powdered peepul & turmeric.
Abutilon I.
Acacia, A.C.F. & S.
Alumen.
Aegle M.
Aloe Barbadensis.
Bombusa Arundinacea.
Calotropis gigantea.
Cannabis indica, (*P.H.T.*)
Cannabis Sativa (*P.H.T.*)
Cocculus C. & V.
Myrica N.
*Prameha Mihira Taila.*
Agave A.
Althaea O.
Amaranthus Poly.
*Amrita guggula.*
*Ananda Bhairava Rasa.*
Andropogon Muricatus.
Asparagus racemosus.
Averrhoea A.
Balsamodendron M. & O.
Basella A.
Bauhinia V.
Boerhavia D.
Bombax M.
Borassus F.
Boswellia G.
*Brihat Bangeshwara Rasa.*
Calotropis G.
Canarium C.
Cannabis sativa.
Cephalandra I.
*Chandraprabha gutika.*
Cinnamomum camphora, & C. tamala.
Citrullus V.
Corchorus C.

Cubeba O.
Cucurbita M.
Curculigo O.
Curcuma Ang. & Z.
Datura A.
*Devdari kvatha.*
Dillenia I.
Diospyros E.
Dipterocarpus T.
Emblica O.
Enhydra F.
Eriodendron A.
Euphorbia T.
Ficus B.
Galega P.
Garcinia M.
Geranium W.
*Giloe-ka-sat* (starch from Tinospora C.)
Gloriosa S.
Gmelina A. & Asi.
*Gokshuradi guggula.*
Grewia V.
Hemidesmus indicus.
Hibiscus A. R. & S.
Holostemma R.
Hydnocarpus I.
Hydrocotyle A.
Ipomoea P.
Ixora C.
Juniperus C.
Justicia adhatoda.
*Kaisara guggula.*
*Kanchanara guggula.*
Lawsonia A.
Linum U.
Liquidambar O.
Malva S.
Melia azadirachta.
Memecylon E.
Michelia C.
Mimusops elengi.
Mimosa Am.
Molluga Cerviana.
Moschus moschiferus.
Musa S.
Ocimum gratissimum.
*Pachanabheda Churna.*
Pedalium murex.
Phyllanthus Emblica.
Piper cubeba, & longum.
Pistacia species.
Plantago ispagula.
Plumbum calcined.
Pongamia G.
Premna integrifolia.
Prunus amygdalus.
Pyrus species.
Quercus I.
Raphanus S.
*Sadanga guggula.*
*Salvarsan.*
Santalum A.
Sesamum I.
*Shankha Bhasma.*
Shorea R.
Sida A.C. & R.
Silicium salts.
Sodium salts and preparations.
Solanum nigrum.
Spondias M. etc.
Stannum preparations.
Strychnos P.
*Suvarna Vasanta Malti.*
*Swarna Banga,* with the juice of raw turmeric or juice of leaves of *yagna-dumbur.*
Terminalia A. etc.
Tinospora cordifolia.
Tribulus terrestris.
*Triphala guggula.*
*Vatari Rasa.*
Zinc salts and preparations.

**121. GOUT: (Vatarakta; Aamavatham).**

Aconitum.
Allium S.
(chronic):—
Aristolochia indica.
Asparagus O.
Brassica N.

Capparis A.
Cassia, F. & T.
Celastrus P.
Citrus Au. C. & B.
Cocculus C.
Colchicum L.
Datura A.
*Devadari kvath* from Cedrus deodara.
Digitalis, *(P.H.T.)*
Dodonaea V.
Euphorbia A.
Ficus C.
Flacourtia S.
Gossypium I.
Hermodactylus G.
Hyoscyamus N.
Ipomoea P. & T.
Litsaea S.
Lycopersicum F.
Michelia C.
Morinda C.
Moringa P.
Mullugo C.
(for uric acid diathesis): —
Paederia F.
Physallis species.
Pinus species.
Plantago I. & O.
Potassium salts.
Psidium G.
Pyrethrum I.
Pyrus species.
Rhododendron *(P.H.T.)*
Ricinus C.
Rosebay.
Sapindas C.
*Sarveshvar Rasa.*
Semecarpus A.
Smilax C. etc.
Sodium salts and preparations.
Solanum N. & T.
Strychnos N.
Sulphur and its preparations.
Tribulus T.
Tylophora A.
Utrica urens, *(P.H.T.)*
Vitis V.
Zingiber O.

**122. GRAVEL:—(Sharkara; Calculirenal):—**

Cedrus deodara.
Gossypium I.
Hemidesmus indicus.
Hygrophila S.
Mimosa P.
Saxifraga L.
(uric acid): —
Sodium salts and preparations.
Tribulus terrestris.

**123. GUMS: Diseases of:—See also "Antiseptics", & "Astringents":—(Dantaveshtharoga):—**

Acacia C. & S.
(bleeding): —
Areca C.
Gossypium I.
*Kathlon.*
Rhus S.
Symplocos R.
(spongy): —
Balsamodendron My.
Cajanus I.
Eugenia J.
*Kathbol.*
Morinda C.
Rumex C.
Symplocos R.
*(spongy and bleeding):—*
Eucalyptus G.
Phyllanthus species.
*Svalpakhadiravatika.*
(boils): —
Heliotropium I. & S.
Jatropha C.
(bleeding teeth): —
Barleria P.
(swelling): —
Psidium G.
(irritation): —

Spilanthus O.
(Scurvy):—
Hydrastis canadensis (*P.H.T.*)

**124. HAEMATEMESIS: (Aamasayakshata; Raktapittam).**

Aconitum (*P.H.T.*)
Coccus lacca.
Dalbergia Sis.
Hamamelis (*P.H.T.*)
Ipecac (*P.H.T.*)
Mangifera I.

**125. HAEMATURIA: (Shonitameha; Raktapittam):—**

Abutilon I.
Bauhinia V.
Cantharis (*P.H.T.*)
Hamamelis (*P.H.T.*)
Saccharum O.
Sida C.

**126. HAEMOPTYSIS:— (Oorakshata; Oordhwagata; Raktapitta; Uraksatam).**

Abies W.
Acacia catechu.
Acalypha indica (*P.H.T.*)
Adhatoda V.
Bambusa A.
*Banga Bhasma* with turmeric.
Benincasa C.
Carica papaya.
Cucurbita M.
Cynodon dactylon in Haematuresis (*P.H.T.*)
Dalbergia Sis.
Erigeron C.
Ficus G.
Hamamelis (*P.H.T.*)
*Khanda kooshmanda.*
Musa paradisiaca.
Stannum preparations.
*Talisadya Churna.*
*Vasakushmanda kanda.*
*Vasava Leha.*
Vitex N. etc.

**127. HAEMORRHAGE:— (Raktapitta; Raktasravam)**

Abies webbiana.
Acacia A. & C.
Adhatoda Vasika.
*Amalakadya Lauha.*
Arum C.
Asparagus racemosus.
Bambusa arundanacea.
Bombax malabaricum.
Cinchona (*P.H.T.*)
Coccus lacca.
Cucurbita M.
Diospyros embryopteris.
Emblica O.
Erigeron C.
Ferri Sulphas.
*Friar's Balsam.*
Geranium W.
Hamamelis, (*P.H.T.*)
Holarrhena antidysenterica
Ipecac, (*P.H.T.*)
Ipomoea turpethum.
Jatropha C.
*Kandakadya Lauha.*
Mangifera I.
Nymphoea species.
Pavonia O.
(Postpartum):—
Plumbago species.
Viburnam F.
(rectal):—
Plumbum and its salts
(internal):—
Potassium salts.
Quercus I.
Santalum album.
Saraca indica.
Silicium salts.
*Utphaladi Sritam.*
Woodfordia F.
Pterocarpus species.
Punica granatum.

(uterine and pulmonary):—
Rosa species.
(urethral):—
Santalum A.
Saraca I.
*Sudhanidhi Rasa.*
Symplocos racemosa.
Terminalia A. etc.
*Triphala.*
Urtica D.
Viscum A. etc.
(intestinal):—
(*Raktapitta-adhogat.*)
Vitex N.
Vitis Vinifera.

**128. HAEMORRHOIDS: (Arsas) See "Piles":—**

**128(a). HARD-BREATHING: Clerodendron siphoenanthus; Hyoscyamus niger. (See also:—"Antispasmodics"; "Asthma" & "Expectorants").**

**129. HEADACHE: (Shirashool):—**

Acalypha indica.
Agati G.
Allium S.
Andropogon Muricatus.
Aplotaxis auriculata.
Aquilaria agallocha.
Barringtonia A.
Basella A.
Caryophyllus aromaticus.
Cedrus deodara.
Centipeda O.
Cinnamomum C. & T.
Coleus A.
Crocus S.
Cubeba O.
Embelia R.
(rheumatic):—
Ficus Benja.
Gossypium I.
Herpestis M.
Hyocyamus niger.
Ipomoea R.
Ixora C.
Jasminum G.
Lavendula S.
Luffa Am.
(nervous):—
Melia Azedavach.
Myrica sapida.
Peterospermum species.
(congestive):—
Mentha P.
Momordica D.
Moringa P.
Myrica N.
Myristica M.
Nardostachys J.
(bilious):—
Oxalis C.
Pandanus O.
Phoenix species.
Pimpinella A.
Piper betle, & P. nigrum.
Potassium salts.
Pterocarpus species.
Pyrus species.
Randia D.
(obstinate):—
Saccharum O.
Santalum A.
*Shadabindu Taila.*
Sinapis J.
(neuralgic):—
Sodium salts and preparations.
Spilanthus O.
Strychnos N.
Terminalia Cat. etc.
Trichosanthes species.
Vitex N. etc.
Zingiber O.

**130. HEART-DISEASE: Pericarditis; Agina-pectoris: (Hridroga; Hrad-graha).**

Aegle Marmelos.
Allium S.

*Arjunabhra.*
Boerhavia diffusa.
Calotropis gigantea.
Cassia fistula.
Cedrus deodara.
Cinnamomum camphora.
(Heart-burn): —
Citrus B.
Glycyrrhiza glabra.
*Dava-ul-mulk.*
*Hridayarnava Rasa.*
*Majoonai Kuvathiabah.*
(palpitation): —
Mentha P.
Moschus moschiferus.
*Mukta Bhasma.*
Nardostachys J.
Viscum A. etc.
(irritable heart and angina): —
Papaver S.
(aneurism of aorta and hypertrophy): —
Piper longum.
Plumbum and its salts.
Sida cordifolia.
Sodium salts and preparations.
Solanum N.
*Swarna Bhasma.*
Terminalia A. etc.
*Vasakushmanda kandu.*
Vitis V.
Zingiber officinale.
(for faulty and dyspeptic hearts): —
Adonis aestivalis (*P.H.T.*)
Lime-juice, *for hysterical palpitation* of heart and heart-burn (*P.H.T.*)

**131. HEMICRANIA: (Ardhavabhedakam; Arthasisa):—**

Barringtonia R.
Caryota U.
Centipeda O.
Clitoria T.
Embelia R.
Ferula A.
Hedysarum A.
Luffa Am.
Sapindas T.
*Vidanga Taila.*

**132. HEMIPLEGIA: (Ekangavatham; Pakshaghat-Pakshvadha):—**

*Ajmodadi Churna.*
Asparagus R.
Atalantia M.
Ichnocarpus F.
Illicium V.
*Mashabaladi.*
*Mashabaladi Kvatha.*
*Narayana Taila.*
Orchis M.
*Svalparasuna Pinda.*
*Vataraktantaka Rasa.*

**133. HEPATITIS: (Yakratdalyudar; Yakrithrogam):— See also: Enlargement of the liver:—**

*and Hepatic derangements:—*
Aloe litoralis.
Andrographis paniculata.
Berberis asiatica.
Croton Oblongifolius.
Hirudo medicinalis.
Picrorhiza Kurrooa.
Viscum A. etc.

**134. HERNIA: (Antravriddhi):—**

Alpinia officinarum.
Oleum ricini.

**135. HERPES: (Kaksha):—**

Ammonia B.
Argemone M.
Butea F.
Cassia alata.
*Chaulmugra Ointment.*
Cucumis T.

Gynocardia O.
Jasminum Ang.
Jatropha C.
(Herpes Zoster):—
Pterocarpus species.
(tetter):—
Triticum S.

**136. HICCOUGH or HICCUP: (Hikka; Oochaku):— See:—Dyspnoea.**

Ananas S.
Balsamodendron Mukul.
Cassia S.
Cuminum cyminum.
Feronia elephantum.
Hyoscyamus N.
Lepidium Sativum.
Mentha P.
Menthus A.
Piper longum; & P. nigrum, & P. chaba.
Saccharum officinarum.
Santalum album.
Stereospermum Suaveolens.
Tincture of acetic acid (*P.H.T.*); Vinegar (*P.H.T.*)

**137. HIGH-BLOOD PRESSURE:—**

Ranwolfia Serpentina (*P.H.T.*).

**138. HOARSENESS: (Svarabhanga; Svarabheda):— See also:—"Aphonia".**

Abies webbiana.
Abrus P.
Alpinia G.
Alumen.
*Drakshariskta.*
Flacourtia C.
Glycyrrhiza G.
Herpestis Monniera.
Piper longum, & P. chaba.
Saccharum officinarum.
Terminalia B.

**139. HOOK WORM:— (See also:—Anthelmintics).**

Carum copticum.

**140. HYDROCELE: (Andavriddhi):—**

**(See also:—Antiphlogistics):—**

Alpinia officinarum.
Altingia E.
Datura fastuosa.
(Chronic affections):—
Oleum Ricini.
Rosebay.
Sesbania species.
(painful and swollen):—
Solanum N.

**141. HYDROCEPHALUS:**

**(Chronic):—**

Squalus C. preparations.

**142. HYDROPHOBIA:— (Alarkavisham; Jalatrasa):—**

Boerhavia diffusa.
Cerebera O.
Calcium oxide or Calx (*P.H.T.*)
Datura A. & fastuosa., & D. Stramonium, (*P.H.T.*).
Euphorbia N.
Indigofera tinctoria (*P.H.T.*).
Ophiorrhiza M.
Strychnos N.

**143. HYDROTHORAX:—**

Sonchus species.

**144. HYPERCHLORHYDRIA: (Amlapittam):—**

Anacardium occidentale (*P.H.T.*)
Capsicum, (*P.H.T.*).

**145. HYPOCHONDRIASIS:—**

Aegle marmelos.
Ferula A.

Hydrocotyle A.
Hyoscyamus N.
Strychnos nux-vomica.
(*P.H.T.*).

**146. HYSTERIA:—(Apasmara; Aptantrak):— (See:— Epilepsy; Uterine disorders):—**

Achyranthes aspera.
Acorus C.
Adamas.
Adhatoda V.
Allium C. & S.
Anona S.
Aplotaxis auriculata.
*Brahmighrita.*
Brassica A.
Camphora O.
Carum copticum.
Castoreum, (*P.H.T.*).
Citrus Au.
Curcuma L.
Echinops E.
Elaedendron G.
Ferula A. & G.
*Gorochanam.*
Grangea M.
Hermodactylus G.
Herpestis M.
Hibiscus A.
Hyoscyamus N.
Hyssopus O.
Moringa P.
Moschus moschiferus. (*P.H.T.*)
Nardostachys J.
Ptychotis A.
Quassia E.
Ruta G.
Sapindus T.
*Siddhartha Ghrita.*
Sodium salts and preparations.
Valeriana species.
(locally):—
*Vasa Chandanadi Taila.*
Viscum A. etc.
Viverra C.

Zinc salts and preparations.
Zingiber officinale.

**147. IMPETIGO:—**

Cocculus V.
*Karaviradya Taila.*

**148. IMPOTENCE:— (Dhwajabhagam)**

*Abhraka Bhasma & Kalka.*
Adamas.
*Akaradi Churna.*
*Akarakarabhadi Churna.*
Albizzid lebbek.
Amaranthus Poly.
*Amritashtakapachana.*
Asparagus A.
*Banga Bhasma.*
Bassia La.
Biborate of Sodium.
Bombax malabaricum.
*Chandrodaya Makaradhvaja.*
Crocus S.
Cycas C.
Datura fastuosa.
*Dava-ul-mulk.*
Dendrobium M.
Dryobalanops aromatica.
Echinops E.
Eriodendron A.
Erythrina indica.
Helianthus T.
Hermodactylus G.
Hibiscus Rosa S. &. E.,
Hygrophila spinosa.
Ipomoea digitata.
*Javarish-i-lulu.*
*Java rusa uda.*
Lepidium S.
Lycopodium clavatum (*P.H.T.*)
*Mahalakshmibilas Rasa.*
*Majoonai-Kuvathiabah.*
*Makaradhvaja.*
*Mashadi-Modaka.*
*Methi-ladu.*
Mucuna P.
Myristica F.

*Narasimha Churna.*
Nardostachys J.
Orchis M.
Ostrea E. & its preparations.
Pedalium M.
*Phalaghrita.*
Phaseolus species.
Pinus species.
Pistacia species.
Plumbum.
*Ratnagiri Rasa.*
*Sarvangsundari Rasa.*
Sesamum indicum.
*Shalavari Ghrita.*
Smilax C. etc.
Spmacoce hispida.
Sphaeranthus H. etc.
Stannum preparations.
Strychnos N.
*Suverna-Vasanta Malti.*
*Svarna Bhanga (Bisulphurette of tin).*
*Trailokya Chintamani Rasa.*
Tribulus T.
Trigonella F.
Uraria lagopoides.
*Vakeria ladu.*
*Vanari vatika.*
*Varunadya ghrita.*
*Vasantakusumakara Rasa.*
*Vrihat Asvagandha Ghrita.*
Withania S.

**149. INDIGESTION:**
**(Apachana; Ajeerna). See: "Carminatives; Digestives" & also "Dyspepsia" & "Flatulence":—**

*Agnikumara Rasa.*
*Allae pauk.*
Aloe litoralis.
*Amrita Vati.*
Aplotaxis auriculata.
*Bhaskara Lavanam.*
*Chatuhsama Vati.*
Coriandrum sativum.
*Dhana-ni-dala.*
*Drakshasava.*
Gentiana K.
Hyoscyamus niger.
*Jawarish-ai-kammon.*
(want of acidity):—
*Jawarish-ai-Thrash.*
(for causing emesis):—
*Madanadi Vamana.*
Myristica M.
(digestive disorders):—
Plumbago species.
Potassii carbonas.
Ptychotis A.
Punica granatum.
Saline substances.
Semecarpus anacardium.
Terminalia chebula.
*Vaishnavanar Churnam.*
Vitis Q. etc.
Zingiber O.

**150. INFLAMMATION:**
**(See:— "Antiphlogistics"; Anodynes; & "Antiseptics"):—**

Aconitum F.
(Breasts):—
Aloe L.
Ammonii carbonas.
Aplotaxis auriculata.
Boerhavia diffusa.
Cinnamomum Camphora & Z.
Datura A. & F.
Ghee.
Gynandropsis P.
Hugonia M.
Hygrophila spinosa.
Linum U.
Melia Azadirachta.
Papaver somniferum.
Pavonia O.
Phyllanthus species.
Polyporus O.
Pterocarpus species;
(gastro-intestinal):—
Allium sativum.
Andropogon muricatus.

Borax.
Ipomoea turpethum.
Oleum ricini.
Phaseolus species.
(of mucous membranes):—
Acorus calamus.
Glycyrrhiza glabra.
Pyrus species.
Rubia C.
Semecarpus anacardium.
(rheumatic):—
Sesbania species.
Soymida F.
*Svalpa Masha Taila.*
Tamarindus I.
Terminalia belerica.
Trigonella F.
Vitis vinifera.
Withania S. etc.
(erysipelatic):—
Triticum S.
Vateria I. etc.
Zingiber officinale.

**151. INFLUENZA: (Dushta-pratishyaya) (Prathisyayika-jwaram):— See:— "Cough", "Fever" & pneumonia):—**

Andrographis paniculata.
*Brihat Sudarshana Churna.*
Camphora officinarum, (*P.H.T.*).
Cinnamomum C. & Z.
Citrus B.
Eucalyptus globulus. (*P.H.T.*).
Glycyrrhiza G.
Hyssopus O.
Moschus moschiferus.
Piper nigrum.
Sodium salts and preparations.
Solanum Xanthocarpum.

**152. INJURIES:— (See:—"Antiphlogistics" and ("Antiseptics")**

Ammonii carbonas.
Sugar.

**153. INSANITY: (Unmada):— See:—"Epilepsy"; "Uterine disorders" & "Vata" diseases):—**

Acorus C.
Aegle marmelos.
Aplotaxis auriculata.
Benincasa C.
Canscora D.
Croton T.
Datura A. & F.
Herpestis M.
Hydrocotyle A.
(dementia):—
Hyoscyamus N.
Jasminum S.
*Kushmanda Ghrita.*
Lactuca S.
Ranwolfia serpentina.
*Swarna Bhasma.*
Zingiber officinale.

**154. INSOMNIA (Aswapna-Nidranash):— (See:—"Hypnotics"):—**

Allium cepa. (*P.H.T.*).
Avena sativa. (*P.H.T.*).
Boerhavia diffusa.
Camphora officinarum. (*P.H.T.*).
Cannabis I & S.
Cimicifuga racemosa. (*P.H.T.*).
Hot milk. (*P.H.T.*).
Hyoscyamus N.
Lactuca S.
Lagenaria V.
Myristica F.
Papaver S.
Piper longum.
*Rasa-Raj-Rasa.*
Sinapis J.
(from over fatigue):—
Strychnos N.
Valeriana indica. (*P.H.T.*).

Vitis vinifera.
Withania somnifera.

**155. INTESTINAL DISEASES:—See:— "Bowel complaints"**

**156. INTOXICATION: (See:—Diuretics; Emetics & Purgatives)**

Boerhavia diffusa.

**157. ITCHES:— (Vicharchika) (See:—"Antiseptics"):—**

Adhatoda Vasika.
*Adityapaka Taila.*
Allium sativum.
Andrographis paniculata.
Atalantia M.
Bassia Lon.
Carthamus T.
Cassia O.
(Dhobi):—
Cassia S.
Cephalandra I.
Cinnamomum camphora.
Cocculus S.
Curcuma L.
Emblica O.
Euphorbia N. & Tir.
Galega P.
Hemidesmus indicus.
Hibiscus A.
Jatropha C.
Liquidamber O.
Momordica C.
Oleum Ricini.
Os Sepie & its preparations.
Plumbum and its salts.
Rhinacanthus C.
Santalum A.
Sulphur.

**158. JAUNDICE: (Kamila; Kumbha-Kamla):— (See also:—"Liver affections"):—**

Aconite. (*P.H.T.*).
Aegle M.
Allium C.
Aloe barbadensis.
*Banga Bhasma.* (Stannum).
Boerhavia D. & R.
Calotropis G.
Carthamus T.
Citrullus C.
Cocculus C.
*Cowrie Bhasma.*
Curcuma L.
Cyperus Rotundus.
Daucus C.
*Dhatri Arista.*
*Dhatri Leha* or *Lauha.*
Digitalis. (*P.H.T.*).
Eclipta E.
Emblica O.
Ferri Sulphas.
Flacourtia R.
Fumaria O.
Glycyrrhiza glabra.
*Gudashtaka.*
Holarrhena A.
Hydrocotyle A.
Hygrophila S.
Ipomoea turpethum.
Jatropha Mon.
*Krimidhulijalaprabha Rasa.*
Lawsonia A.
Luffa E.
Melia Azadi.
Mimosa pudica.
Momordica C.
Nardostachys J.
*Patoladya Churnam.*
Peganum H.
Phyllanthus species.
Picrorrhiza Kurrooa.
*Pittantaka Rasa.*
Podophyllum emodi (*P.H.T.*).
*Punarnava Leha.*
*Punarnavasthaka.*
*Punarnava Taila.*
Rheum E.
Rubia C.
*Shankha Bhasma.*

Sphaeranthus H. etc.
Stannum preparations.
Styrax B.
Taraxacum O. etc.
Tinospora cordifolia.
Urine (cow's) and preparations.
Urine (Ox's).
*Visamajvarantaka Lauha.*
Vitis V.
*Yakridari Lauha.*

**159. KALA-AZAR:—**

Vitex P.

**160. KAPHA DISEASES:— (See also "Expectorants" & "Tonics").**

Adhatoda vasika.
Andrographis paniculata.
Cinnamomum camphora.
Mel depuratum.
Piper longum.
Solanum Xanthocarpum.

**161. KIDNEY DISEASES:— (Vrikkaroga).**

Hemidesmus I.
(polyuria):—
*Laboobai Saghur.*
Michelia C.
Ocimum species.
Petroselinum S.
Piper species.
Xanthium S.
(irritable or inflammatory):
Oryza S.
(painful):—
Portulaca species.
Prunus Amyg.
(renal colic):—
Siegesbeckia O. etc.
Viola species.

**162. LABOUR PAINS:—**

Actaea, (*P.H.T.*).
Cimicifuga, (*P.H.T.*).

**163. LARYNGITIS: See Cold; Hoarseness.**

Cubeba O.
Genuine Amber beads. (*P.H.T.*).
Styrax B.

**164. LEPROSY:— (Mahakusta; Kushtani; Kustaroga)**

Abrus precatorius. (*P.H.T.*).
Acacia Catechu.
Aconitum ferox.
Alangium D. & L.
Alstonia S.
Anacardium orientale 6th, (*P.H.T.*).
Argemone M.
Aristolochia indica.
Arsenicum.
*Banga Bhasma.*
Bauhinia V.
Boerhavia diffusa.
Caesalpinia B.
Calotropis gigantea.
Cassia tora.
Cedrus deodara.
Cupri sulphas.
Curcuma longa.
Diospyros E.
Dipterocarpus T.
Embelia ribes.
Ficus glomerata. (*P.H.T.*).
Fumaria O.
*Galithkasturi Rasa.*
*Gadhakadi Churna.*
*Gandhakadi Taila.*
*Gandhaka Ghrita.*
*Gandhaka Rasayana.*
Gloriosa S.
Gynocardia O.
Hemidesmus indicus.
*Hiraka Bhasma.*
Holarrhena antidysenterica.
Hydnocarpus I. V. & Wightiana.
Hydrocotyle A.
Indigofera A.

Ipomoea T.
Lawsonia A.
Luffa A.
*Magnesium gynocardate.*
Melia azadirachta.
Melia Azedarach.
Mimosa Am. & P.
Momordica C.
Myristica fragrans.
Nardostachys J.
Nelumbium S.
Nerium O.
*Panchanimba Gutika.*
*Pancha Valkaladi Tailum.*
Peterospermum species.
Pinus deodara.
Piper C. & L.
Plumbago species.
Pongamia G.
Psoralia C.
Rubia cordifolia.
Semecarpus A.
Smilax China.
Sulphur.
Symplocos Racemosa.
(locally):—
*Tamra Bhasma.*
Terminalia Cat. etc.
Tinospora cordifolia.
Trichosanthes species.
Urginea I. etc.
Urine (cow's) and preparations.
Vernonia C. etc.
Vitex N. & T.
Zingiber Z.

165. LEUCODERMA:—

Abrus precatorius.
Aristolochia I.
*Panchanimba Gutika.*
Psoralea C.
Realgar.
Vernonia A.

**166. LEUCORRHOEA:—**

**(Pradaravata; Pradarswet; Somarogam; Swethapradaram):—**

**See: "Gonorrhoea".**

Acacia A.
Amaranthus Poly.
Asphaltum (*Shilajit*).
Balsamodendron O.
Berberis A.
Bombax malabricum.
Borax 2 x. (*P.H.T.*)
Cimicifuga (*P.H.T.*)
Cinnamomum camphora.
Cocculus C.
Cubeba O.
Curcuma Z.
Daedalacanthus R.
Dipterocarpus D.
Emblica O.
Ferrum (*Lauha Bhasma*).
Ficus R.
Flemingia T.
Garcinia M.
Geranium W.
Glycyrrhiza G.
Gracilaria L.
Hemidesmus I.
Hygrophila S.
Ixora C.
*Javaru-sa-uda.*
Juniperus C.
Lawsonia A.
Lepidium S.
Liquidambar O.
Mangifera I.
*Mashadi Modaka.*
Melia Azadi.
Memocylon E.
Mesua ferrea.
Mucuna P.
*Musalyadi Churna.*
Myrtus C.
*Pachanabheda Churna.*
Phaseolus species.
Phyllanthus emblica.
Pinus species.
Piper cubeba.

Pistacia species.
*Pradararipoo Rasa.*
Pterocarpus species.
Quercus I.
*Rhus S.*
Santalum album.
Saraca indica.
Sida C.
*Someshwara Rasa.*
Spondias M. etc.
*Swarna-banga* (Bisulphurette of tin).
Symplocos racemosa.
Tamarix G. etc.
Terminalia cheb.
Trapa B. etc.
Trigonella F.
*Valkala Kashaya.*
*Vanari Vatika.*
Woodfordia E.
Xanthuim S. etc.
Zinc salts and preparations.

**167. LITHIASIS:—**

Kalanchoe L.
Salvadora species.
Zea M.

**168. LIVER AFFECTIONS: (Yakridroga):— (See:—Carminatives; Digestives and Purgatives; Ascites and Dyspepsia).**

(infantile):—
Andrographis paniculata (*P.H.T.*)
(congestion):—
*Aghora Narasimha Rasa.*
Ammonii carbonas.
Amomum S.
Casearia E.
Sodium salts and preparations.
Trichosanthes species.
(enlargement):—
Andrographis paniculata.
Calotropis gigantea.
Canavalia E.
Croton O.
Eclipta erecta.
Euphorbia N.
Ficus A.
Ficus carica (*P.H.T.*)
Gentiana K.
Gymnema S.
Hydrargyrum.
Hygrophila spinosa.
Ipomoea D.
Jatropha G.
Lawsonia A.
Luffa E.
Melia Azadirachta.
Moringa P.
Ostrea E. and preparations.
*Panchalavanam.*
Picrorrhiza Kurrooa.
Pinus species.
Prunus Amyg.
Pyrethrum I.
*Rasakarpura.*
Saline substances.
*Sankadravakam.*
Solanum I. & N.
Sulphur and its preparations.
Swertia C. etc.
Terminalia cheb.
Tinospora cordifolia.
Trigonella F.
Zingiber officinale.
(torpor):—
Cichorium I.
Cocculus C.
Cosmostigma R.
Cyperus P.
Euonymus.
Ferula A.
Hermodactylus G.
Lycopersicum E.
Pistacia species.
Podophyllum E.
Prunus Amyg.
Citrullus C.
*Cowrie Bhasma.*
Cuscuta R.
Eclipta E.

Ficus Benja.
(obstructions): —
Ficus H.
Fumaria O.
Garcinia P.
Gentiana K.
(induration): —
Hyssopus O.
Lactuca S.
*Lokanatha Rasa.*
Momordica C.
Myristica F.
Nelumbium species.
Ocimum species.
(bilious obstruction): —
Paeonia E.
Phaseolus species.
Portulaca species.
Rumex C.
Sodii B.
Symplocos R. etc.
(visceral): —
Taraxacum O.
Tinospora cordifolia.
Viola species.
Vitex N. etc.
Woodfordia F.

**169. LOCHIA:—(Suppression after child birth):—**
Cinnamomum tamala.

**170. LOCK-JAW:—**
**See: "Tetanus".**

**171. LOCOMOTOR ATAXIA:**
Digitalis (*P.H.T.*)
Zinc Phos. 12 (*P.H.T.*)
Zinc Sulphate (*P.H.T.*)

**172. LUMBAGO: (Kateegraha; Katgraha; Trikagraha):—**

Areca C.
Balsamodendron M.
Caryophyllus aromaticus.
Cervus dama.
Citrus B.C. & L.
Datura A.
Euphorbia R.
*Narayana Taila.*
Peganum H.
Ricinus Communis.
Shorea R.
*Trayodasanga guggula.*
Triticum S.
Withania S.

**172(a). LUNACY:—**
**See:—Insanity.**

**173. LUNG COMPLAINTS:- (See also:—"Asthma;" "Consumption" and "Expectorants"):—**

(pectorals): —
Abies Webbiana.
Adhatoda vasica.
Bambusa arundinacea.
Juniperus C.
Liquidambar O.
Myrica N.
Papaver somniferum.
Portulaca species.
Rourea S.
Ruta G.
(inflammation): —
Spinacea O.
Stannum preparations.

**174. MAGGOTS:—**
**See:—"Ozaena".**

**175. MALARIA: (Vishamajvara):—**

(chronic): —
*Aghore Nrisingha Rasa.*
*Amritashtakapachana.*
*Ananda Bhairavi.*
Andropogon C.
*Bindaal.*
*Chanadya Lauha.*
Cocculus C.
Eurycoma L.
Sida A.
*Shadanga Paniya.*

Strychnos C. etc.
Swertia C. etc.
(with enlarged spleen): —
*Dhatrimodaka.*
Gentiana K.
Helianthus A.
*Jwaramurari Pills.*
*Majoonai Saul.*
*Panchathiktaka panakam.*
*Panchathiktaka powder.*
Sodium salts and preparations.
Toddalia A.
Vernonia C. etc.
Vitex P.
Xanthium S. etc.

**176. MAMMARY DISEASES: (Sore breasts):—**

Peteroselinum S.
(deficient secretions and sore nipples): —Ricinus C.
(Sore nipples): —
Sodium salts and preparations.
(breast inflammation): —
Aloe L.
Datura A.
Polyporous O.

**177. MANIA: (Unmada):— See:—Insanity.**

Acalypha I.
(acute): —
Cannabis S.
Datura A. & F.
Helleborus N.
Hyoscyamus N.
(puerperal): —
Michelia C.

**178. MARASMUS:—**

Indigofera E.
Plumbum in the 3rd trit. (*P.H.T.*)

**178(a). MEGRIM:— See:—Migraine.**

**179. MELANCHOLIA:—**

Crocus S.
Ipomoea T.
(mental troubles): —
Trichosanthes species.

**180. MENINGITIS:—**

(Spinal): —
Croton T.
Sulphur and its preparations.
Zincum metallicum (*P.H.T.*)

**181. MENORRHAGIA:—**

**(Asrigdaram; Raktapradara):—**

Amaranthus Poly.
Bauhinia V.
Berberis asiatica.
Bombax malabaricum.
Cannabis S.
Dalbergia Sis.
Eriodendron A.
Ficus G.
Hibiscus Rosa S.
Holarrhena A.
*Jatiphaladi Churnam.*
Lawsonia A.
Mangifera I.
Memecylon E.
Mucuna P.
Musa S.
Myristica F.
Nelumbium S.
Phyllanthus emblica.
*Pradarari Lauha.*
Saraca indica.
Sesbania species.
Symplocos racemosa.
Trapa B. etc.
Triticum S.
*Vanari Vatika.*
Viscum A. etc.
Woodfordia floribunda.
Xanthium S. etc.

**182. MENSTRUAL DISORDERS:—**
**See:—"Uterine Diseases".**

**183. MERCURIAL SALIVATION:—**

Acacia Catechu.

**184. MIGRAINE:—**
**See:—Megrim (Vathasirasoolam).**

Caffein (*P.H.T.*)

**185. MUMPS:—(Pashanagardhaba):—**

Aconite (*P.H.T.*)
Conium maculatum (*P.H.T.*)
Datura A.
Kaempforia R.

**186. MYOSIS:—**

Ocimum species.

**187. MYXOEDEMA:—**

Arsenic.
Iron salts.
Strychnine.

**188. NAUSEA:—**
**(See:—"Anorexia"; Hrittasam; Hrullas).**

Cinnamomum C. & Zeylanicum.
Michelia C.
Zingiber officinale.

**189. NEPHRITIS: (Vrikka-sopha; Vrikka-shoath):—**

Arsenite of copper (*P.H.T.*)
Cissampelos P.
Cycas C.
Physalis species.

**190. NERVOUS DISEASES & DISORDERS: (Vatavyadhi):—**

Achyranthes aspera.
Acorus calamus.
Alpinia officinarum.
Aplotaxis auriculata.
*Bala Taila.*
Balsamodendron Mukul.
Calotropis gigantea.
*Chaturmukha Rasa.*
*Chhagaladya Ghritha.*
*Chintamani Chaturmukha.*
Corallium rubrum.
Cuminum cyminum.
Ferula A.
Hydrargyrum.
Hydrocotyle asiatica.
*Mashabaladi.*
*Masha Taila.*
Moschus moschiferus.
Nardostachys J.
*Narayana Taila.*
(irritability):—
Nicotina T.
(weakness & exhaustion):—
Papaver S.
Phaseolus species.
Ricinus C.
*Samiragaja Kesari.*
Semecarpus A.
Sida C.
Strychnos Nux-vomica.
Viverra C.
Withania S. etc.
(chronic):—
Smilax C. etc.
(nervous fatigue):—
Sterculia A.
Sulphur preparations.
Vanda R.
*Vishnu Taila.*
Vitis vinifera .
*Yogendra Rasa.*
Zingiber officinale.

**191. NEURALGIA: (Shoola; Sula; Sirosoolam).**

Aconitum F. & N.
Acorus C.

Adhatoda Vasica.
Allium Cepa and Allium S.
Amomum S.
Andropogon M.
Arsenicum (*P.H.T.*)
Berberis A.
Brassica juncea.
Cannabis S.
Capsicum F. & M.
Cinnamomum C. & Z.
Citrus B.
Crocus S.
*Danawantri Tailum.*
Datura A. & F.
Ferro-ferric oxide.
Hyoscyamus N.
Ipomoea R.
*Jatiphaladi Churnam.*
Lavendula S.
Melanleuca L.
Mentha P.
Moringa P.
Myristica F.
*Narasimha Churna.*
Papaver S.
Phaseolus species.
Premna integrifolia.
Prunus Amyg.
Ptychotis A.
Quinetum.
Rosebay.
Sinapis J.
Sodium salts and preparations.
Squalus C. preparations.
Strychnos N.
*Tribhuvana Keerti Rasa.*
Valeriana species.
Zingiber O.

**192. NEURASTHENIA: (Thathwonmadam):—**

Herpestis M.
(excessive venery):—
Strychnos N.
(cramps):—
Zingiber O.

**193. NEURITIS:— (See:—"Nervous Diseases").**

Piper nigrum.
*Prabhanjana Vimardana.*
Semecarpus A.

**194. NIGHT BLINDNESS: (Sleshmawidagdhadristu; Nakthandhyam):—**

Achyranthes aspera.
*Chandraprabha varti.*
Leganaria V.
Momordica C.

**195. NIGHT SWEATS:— See:—"Phthisis".**

**196. OBESITY: (Medavriddhi; Medo Rogam; Athistawelyam):— See:—"Corpulence".**

**197. OEDEMA: (Udardam):— See:—"Anasarca".**

**198. OPACITY OF THE CORNEA:—**

Achyranthes aspera.
Butea frondosa.
Cinnamomum camphora.
Hedysarum A.
Phoenix species.
Rauwolfia S.
Saccharum officinarum.

**199. OPHTHALMIA: (Catarrhal and purulent):—**

Adhatoda vasica.
Aloe B. & Aloe L.
Alumen.
Andropogon C.
Barringtonia R.
Berberis A.
Cassia Absus & Cassia Auri.

Curcuma L.
Cynodon D.
Emblica O.
Euphorbia N. & R.
Heliotropium I.
Holestemma R.
Michelia C.
Mimosa P.
Nerium O.
Nymphoea species.
Papaver S.
Phaseolus species.
Phoenix species.
*Rasanjana.*
*Rasaut.*
*Rasaventi.*
Ricinus communis.
Sida C.
(purulent):—
Sodium salts and preparations.
Symplocos racemosa.
Tabernamontana species.
Terminalia B.

**200. OPIUM & MORPHINE HABITS:—**

Avena sativa (*P.H.T.*)
Gambogia (Garcinia hanburii) (*P.H.T.*)

**201. ORCHITIS: (Vriddhi):—**

Altingia E.
Bassia La.
Caesilpinia B.
Canabis S.
Gossypium I. & H.
Hamamelis virginiana or verginica (*P.H.T.*)
Holostemma R.
Liquidambar O.
(for causing emesis):—
*Madanadhi Vamana.*
Randia D.
Vitex N. etc.
Vitis V.

**202. OTALGIA:—**

Atropha belladonna (*P.H.T.*)
Gynandropsis P.
Illicium V.
(Noise in ear with headache):
*Mashabaladi Kvatha.*
Moringa P.
Plantago tincture (*P.H.T.*)

**203. OTORRHOEA: (Karnasrava):—**

Allium S.
Alocasia I.
*Apamarga Taila.*
Arun C.
Cleome V.
Curcuma L.
*Gulal.*
Helicteres I.
Os Sepie and its preparations.
Vitis Q. etc.

**204. OZAENA: (Peenash):—**

Centipeda O.
Eucalyptus G.
Hydrocotyle A.
Ocimum species.
Saccharum officinarum.
Sodium salts and preparations.
Squalus C. preparations.
(locally):—
*Tamra Bhasma.*

**205. PALSY: (Oorustambha): See also:—"Paralysis".**

Capparis A.
Euphorbia R.
Ferula A.
(facial):—
*Mashabaladi.*
*Mashabatadi Kvatha.*
Myristica F.
Peganum H.
Semecarpus A.
Strychnos N.

**206. PANNUS CORNEA:—**
**See also:—"Eye Diseases".**

Abrus P.

**207. PARALYSIS: (Pakshavata; Sarvangavatham; Atatvabhinivesh):—**
**(General and facial):—**
**See for 'facial'.**

Aconitum ferox.
Allium cepa, for left-sided facial (*P.H.T.*)
Allium S.
*Bala Taila.*
Causticum 30 (*P.H.T.*)
Celastrus P.
*Chhagaladya Rasa.*
*Danavantri Thailam.*
*Ekangaveera Rasa.*
Ferula G.
(Agitans): — (Vepathoo).
Hyoscyamus N.
Ipomoea T.
*Mashabaladi Kvatha.*
*Masha Taila.*
Moringa P.
Mucuna P.
Myristica F.
Orchis M.
Phaseolus species.
Piper species.
Rhus species (*P.H.T.*)
Rubia C.
Ruta G.
Sapindas T.
(of tongue): —
Spilanthus O.
Stannum preparations.
Strychnos N.
(facial): — (Ardit; Arrditham).
*Svalparasuna pinda.*
Urgina I. etc.
*Vanari Vatika.*
*Vataraktantaka Rasa.*
(for sexual): —
Phosphorus (*P.H.T.*)

**208. PARAPLEGIA: (Ardhitavayu; Urusthambha):—**

*Astakatvara Taila.*
Cocculus (*P.H.T.*)
*Ekangaveera Rasa.*
Lathyrus (*P.H.T.*)
Phosphorus (*P.H.T.*)
Semecarpus A.
*Svalparasuna Pinda*
*Yogaraja guggula.*

**209. PARASITES:—**
**See also:—"Worms".**

(pediculi or lice): —
Cocculus S.
(maggots in nose): —
Crataeva N.
(noxious insects): —
Crinum D.

**210. PAROTITIS:—**
**See:—"Mumps".**

**211. PARTURITION: (Prasutivayu):—**

(delayed): —
Moringa P.
(lying-in): —
Ricinus C.
(difficult and delayed labour):
Sapindas T.
*Saubhagya Sunti.*
Sodii B.

**212. PERIOSTITIS:—**
Indigofera P.

**213. PERTUSSIS: (Sushka-Kasam).**

Lactuca S.

**214. PHIMOSIS:—**
Cannabis sativa (*P.H.T.*)

**215. PHOSPHATURIA:**
**(Ksharoncha; Kshar-meha):—**

*Chandraprabha Gutika.*
Tribulus T.

**216. PHOTOPHOBIA:—**

Cannabis S.

**217. PHTHISIS: (Kshaya; Rajayakshama; Shoash-rajyakshma):—**
**(See:—Consumption, Tuberculosis).**

*Abhra Bhasma.*
Adhatoda Vasica.
Allium sativum.
Asphaltum.
*Banga Bhasma.*
Beninkasa C.
Boerhavia diffusa.
Bombax malabaricum.
Borassus F.
Butea frondosa.
Caesalpinia D.
Calcarea arsenica i.e. Arsenite of Lime (*P.H.T.*)
Cannabis sativa IX (*P.H.T.*)
*Chaturmukha Rasa.*
*Chavanaprasa.*
*Cowri Bhasma.*
(night sweating):—
Adansonia D.
Cocculus S.
Cuprum sulphas.
Datura fastuosa.
Plumbum and its salts.
Polyporus O.
Rosa species.
Saccharum O.
Emblica O.
Flacourtia C.
*Gandhaka Ghrita.*
*Gandhaka Rasayana.*
Gynocardia O.
Hedyotis U.
Hydnocarpus I.
*Jatiphaladya Churna.*
*Kanaka-Asava.*
Orchis M.
(Dyspnoea):—
*Brihat kanchanabhra.*
*Kanchanaabhra Rasa.*
*Khanda Kooshmanda.*
(tubercular):—
*Knysolgan.*
*Mukta Bhasma.* (Mytilus margaritiferus).
Plumbum.
*Praval Bhasma* (Corallium rubrum).
*Sanocrysin.*
*Sarvanagasundara Rasa.*
*Shilajatu.*
*Mriganka Rasa.*
*Mukta Bhasma.*
Ostrea F. & its preparations.
*Pottali Hemagarbha Rasa.*
*Rajamriganka Rasa.*
*Ratnagarbha Pottali Rasa.*
*Ratnagiri Rasa.*
*Sringarabhra or Brihat Sringarabhra.*
Strychnos N.
Sulphur and its preparations.
*Suryavartha Rasa.*
*Suvarna or Swarna Bhasma.*
*Tamra Parpati.*
*Trailokya Chintamani Rasa.*
(locally):—
*Vasachandanadi Taila.*
*Vasakushmanda Kanda.*
*Vasava Leha.*
Zincum (reduced).

**218. PILES: (Arsas; Arsha; Raktarsha; Sushkarsas):—**
**(bleeding) (non-bleeding)**
**See also:—"Indigestion" and "Liver diseases".**

Acacia catechu and Acacia S.
Achyranthes A.

Acorus C.
Aegle M.
Aesculus hippocastanum.
*Agnimukha Lauha.*
Aleurites M.
Allium C.
Aloe B.
Amaranthes Pani.
Amorphophallus C.
*Amrita Bhallataki.*
Anacardium orientale (*P.H.T.*)
Andropogon C.
*Asari Lauha.*
(bleeding):—(Raktarsha).
Averrhoea C.
Bauhinia V.
Beninkasa C.
Berberis A.
Bertholletia E. (Brazil nuts).
Bombax malabaricum.
Cannabis sativa.
Carica P.
Carum carui.
Casearia E.
*Changeri Ghrita.*
Cissampelos pareira.
Cyodon D.
Dalbergia Sis.
*Dasamulakada.*
Datura A. & fastuosa.
Dillinea I.
Dioscorea B.
Eclipta E.
Embelia R.
Eriodendron A.
Euphorbia N.
Ficus C.
Galega P.
*Gandhakadi Churna.*
Gloriosa S.
Gossypium I.
Hedysarum A.
Hibiscus P.
Holarrhena A.
Hypericum P.
Indigofera Tinct.
Ipomoea turpethum.
*Kumari Asava.*
Linum U.
Lippia N.
Luffa A.
*Mana Suranadya Lauha.*
Mangifera I.
Melia Azadi.
Mesua F.
Mimosa Am. & P.
Momordica C. & D.
Mucuna urens (*P.H.T.*)
Myrica N. & Sapida.
Myristica F.
Nelumbium S.
Nymphoea species.
*Pittala Bhasma.*
Plantago ispagula,
Plantago Major (*P.H.T.*)
Plumbago Zeylanica.
Pongamia G.
*Pranada gutika.*
Pterocarpus species.
Saraca I.
Sesamum I.
Shorea R.
Sida C.
Sphaeranthus H.
Tamarindus I.
Terminalia Cheb.
(painful):—
Papaver S.
Pavetta I.
Petroselinum (*P.H.T.*)
Phaseolus species.
Phoenix species.
Piper species.
*Pippali Arista.*
Plantago I.
Plumbago species.
Plumbum and its salts.
Potassium salts.
*Pranada gutika.*
Prunus Amyg.
Pterocarpus species.
Punica G.

Quercus I.
Raphanus S.
*Rasanjana.*
*Rasaut.*
*Rasavanti.*
Ricinus C.
Salvadora species.
*Samasarkara Churna.*
Semecarpus A.
Sesamum I.
(inflamed):—
Sodium salts and preparations.
(locally):—
*Tamra Bhasma.*
Terminalia B. and Cheb.
Tinospora Cordifolia.
Verbascum thapsus, (Mullein leaves) *(P.H.T.)*
Vitis V.
Woodfordia F.
Zingiber officinale.

**219. PIMPLES:—**

(On nose):—
Santalum A.

**220. PITYRIASIS: (Seithma; Sidhma):—**

*Bhringaraja Taila.*
Cassia S.
Eclipta E.
Mallotus P.

**221. PLAGUE: (Maraka; Agnirohini):—**
**(See:—"Fevers").**

Ghee.
Ignatia. (Strychnos Ignatii).
Serpent poison preparations.
Tamarix G.

**222. PLEURISY: (Puphusapakijvaram):—**
**See also:—"Pneumonia".**

Allium sativa.
Boerrahavia D.
Cantharis *(P.H.T.)*
Cervus Dama.
Hirudo medicinalis.

**223. PLEURODYNIA:—**

Cervus Dama.
Cimicifuga (Actaea racemosa) *(P.H.T.)*
Citrus L.
Ranunculus bulb *(P.H.T.)*
Ricinus Communis.

**224. PNEUMONIA: (Kaphasanthathajwaram; Raktasthivi-sannipat):—**
**(See also:—"Expectorants").**

Aconite *(P.H.T.)*
Allium sativum.
Aloe barbadensis.
Cervus Dama.
Cinnamomum camphora.
Embelia R.
Ferula A.
Hirudo medicinalis.
Linum U.
Moschus moschiferus.
Quinine.
Strychnos nux-vomica.
*Tribhuvana Keerti Rasa.*

**225. POISONS & POISONING: (Stavarajangama Visham):—**

Acacia Arabica & A. catechu.
Rubia cordifolia.
(Croton):—
Acorus C.
Ammonii carbonas.
Boerhavia diffusa.
Cannabis sativa.
Trichosanthes dioica.
(tobacco):—
Allium C.
(morphine):—
Cocculus S.
Copper Sulphate.
Datura F.

Oxalis Corniculata.
(copper, arsenic—somala-visha, or corrosive sublimate):—
Saccharum O.
Triticum S.
(of various sorts):—
Salvadora species.
(opium):—
Saxifraga I.
Strychnos N.
(chronic arsenical):—
Semecarpus A.
(narcotic):—
Sinapis J.
Strychnos N.
Valeriana species.
(lead):—
Strychnos N.
(by salts of Mercury, Zinc, Silver, Tin & Iodide).
Triticum S.
Withanea somnifera.

**226. PREGNANCY: Complaints of: (Garbhavyapath):—**

Cereum Oxalate *(P.H.T.)*
Hydrocotyle asiatica *(P.H.T.)*

**227. PRICKLY-HEAT:—**
Os sepie and its preparations.
Santalum A.

**228. PROLAPSUS: (Gudabhramsam):—**

Garcinia M.
Hypericum P.
Podophyllum emodi *(P.H.T.)*
Psidium G. (for prolapse of ani).
(recti):—
*Changeri Ghrita.*
*Compound Ghrita.*
Quercus I.
Strychnos N.
Viola species.
(stricture):—
Sulphur and its preparations.
(uterus):—
Viola species.

**229. PRURIGO: (Rakasa):—**

Cocculus S.
Curcuma L.
*Haridra Khanda.*
*Khadirastaka.*
*Somaraji Taila.*
(chronic):—
Urine (cow's) & preparations.

**230. PRURITUS: (Alasaka):—**
Holarrhena A.

**231. PSORIASIS: (Vicharchika):—**

Canarium S.
Cassia S.
Cephalandra I.
Dipterocarpus T.
Hibiscus P.
Hydrocotyle A.

**232. PTERYGIUM:—**

Butea F.

**233. PUERPERAL DISEASES: (Soothikajwaram):—**

Pedalium M.
(Convulsions):—
Gardenia F.
Sodium salts and preparations.
(diarrhoea):—
*Svalpa Methi Modaka.*
(fevers):—
*Panchajirakapaka.*
Vitex N. etc.

**234. PYAEMIA: Quinine:—**

**235. PYELITIS (Vrikkasodham) & PYELONEPHRITIS:—**

Cantharis *(P.H.T.)*

China (Cinchona) *(P.H.T.)*
Eucalyptol for pyelo-nephritis. also *(P.H.T.)*
Liquidambar O.
Santalum A.
Triticum repens. *(P.H.T.)*

**236. RESPIRATORY COMPLAINTS:—**

Cocculus S.
Ephedra V.
Euonymus.
Ocimum species.
(painful):—
Pinus species.
Solanum I.
(nasal, throat, laryngeal and bronchial):—
Piper species.
(catarrhs):—
Pistacia species.
Plantago I.
Randia D.
Sinapis J.
(spasmodic and phlegmatic):—
Sodium salts and preparations.
*Sambharsing Bhasma.*
(locally):—
*Sambharsing* paste.
(chest diseases):—
Sodium salts and preparations.
(spasmodic):—
Ptychotis A.
Strychnos N.
Tylophora A.
Zingiber O.
(Inflammatory):—
Verbascum T.
(tightness of chest):—
Viola species.

**237. RETCHING:—**
Sinapis J.

**238. RETENTION OF URINE: (Mutraghata):—**
**See:—"Anuria".**

**239. RHAGADES:—**
**See:—"Eczema, Skin diseases and the like).**

**240. RHEUMATISM: (Śandhivata; Amavata; Rakthavatham):—**
**(See also:—"Fevers and Vata diseases").**

Aconitum F. & N.
Acorus C.
*Adityapaka guggula.*
*Ajamodadi Churna.*
Alpinia officinarum.
Aplotaxis auriculata.
Balsamodendron mukul.
Boerhavia diffusa.
Calotropis gigantea.
Carum copticum.
Hydnocarpus wightiana.
Oleum ricini.
Tinospora cordifolia.
(acute):—(Amavatam).
Alangium D.
Allium cepa & A. sativum.
Alstonia scholaris.
Camphora O.
Cinchona C.
*Prasarini Leha.*
Quinine.
Vitex N. etc.
(chronic):—
Andropogon I.
Cocculus V.
*Devadari Kvatha.*
Gynocardia O.
Hemidesmus I.
Hydrocotyle A.
Ipomoea turpethum.
Jatropha C.
Myristica F.
Papaver S.
Pinus deodara and species.
Saussurea L.
Solanum D.
Squalus C. preparations.

Strychnos N.
Vateria I. etc.
Zingiber O.
(for ordinary simple acute rheumatism).
Andropogon M.
Asparagus O. & R.
Balsamodendron M.
Brassica J.
Bryonia E.
Cadaba I.
Calophyllum A.
Cannabis S.
Cardiospermum H.
(muscular):—
Carthamus T.
*Chitra Kathi.*
Strychnos N.
Terminalia cheb.
Cassia S.
Celastrus P.
Cinnamomum tamala.
Citrullus colocynthis.
Citrus Au. & B.
Cocculus C.
Colchicum L.
Crataeva N.
Crocus S.
Croton T.
*Dasamulakada.*
Datura A. & fastuosa.
Pelphinium D.
*Dhanvantri Tailum.*
Dodonaea V.
Ephedra V.
Erythrina I.
Euphorbia A. & Tir.
Farsetia A.
Ferula G.
(headache):—
Ficus Benja.
Flacourtia R. & S.
*Gandhaka Lepa.*
*Gandhakadi Taila.*
Gaultheria F.
Gendarussa V.
*Gokshuradi guggula.*
Gossypium I.
Grewia A.
*Guduchyadi Taila.*
Guizotia A.
Hermodactylus G.
Herpestis M.
*Hinguleshwara Rasa.*
Holarrhena A.
Hyssopus O.
Illicium V.
Ipomoea P.R. & T.
*Ithrphal.*
*Kubja Prasarini Taila.*
Lavendula S.
Lepidium S.
Litsea S.
Lycopodium C.
(stiff neck):—
*Mashabaladi Kvatha.*
Mattricaria C.
Melanleuca L.
Mentha P.
*Methi modaka.*
Mica (reduced).
Michelia C.
Moringa P.
*Mrityunjaya Rasa.*
Mullugo C.
Myristica fragrans & momordica.
Myrtus C.
*Narayana Taila.*
*Nicotiana T.*
Nyctanthes A.
Ocimum species.
Paederia F.
*Pancha Valkaladi Tailum.*
Pandanus O.
Papaver S.
Petroleum (externally) *(P.H.T.)*
Peucedanum species.
Phaseolus species.
Physalis species.
Piper longum.

Plantago I.
Plumbago species.
Pongamia G.
Potassium salts.
Premna integrifolia.
Ptychotis A.
Pyrethrum I.
Pyrus species.
Radia D.
Ricinus communis.
Rosebay.
Rourea S.
*Saindhavadya Taila.*
Salvadora species.
Sapindas T.
*Sarveshwara Rasa.*
Semecarpus A.
Sesbania species.
Sida A.C. & R.
Siegesbeckia O. etc.
*Sinhanada guggula.*
Smilax Chinensis & S. glabra.
Sodium salts and preparations.
Solanum nigrum & S. Xanthocarpum (S. Jacquinii).
Soymida F.
Strychnos N.
Sulphur and its preparations.
*Sunta Ghrita.*
*Svalpa Methi Modaka.*
Terminalia B.
Tionspora cordifolia.
Toddalia A. etc.
*Trayodasang guggula.*
(gonorrhoeal):—
Tribulus T.
Trigonella F.
*Triphala guggula.*
(articular):—
Triticum S.
(syphilitic):—
*Somala Bhasma.*
Tylophora A.
Urgina I. etc.
Vanda R.
*Vata guduchyadi Taila.*
*Vatavaktantaka Rasa.*
(pains):—
Vitex Nigundo & T. etc.
Vitis V.
*Vrihat guduchyadi Taila.*
(with swellings):—
Withania S. etc.
Xanthoxylum species.
*Yogaraja guggula.*

**241. RICKETS:—**

Trigonella F.

**242. RINGWORM: (Dadru):**
**See also "Skin Diseases":**

Allium S.
Andrographis paniculata.
Butea F.
Calotropis gigantea.
Carica P.
Cassia alata. F. S. & T.
Cephalandra I.
*Chakramardha.*
Cinnabar.
Cocculus S.
Cocos N.
Curcuma L.
Embelia Ribes & E. robusta.
Euphorbia T.
Ferula A.
Hibiscus P.
Jasminum Ang. & H.
Mallotus P.
Myristica F.
Nerium O.
Ocimum basilicum.
Piper nigrum.
*Rasa Karpura.*
Rhinacanthus C.
Siegesbeckia O.
*Somraja Taila.*
Triticum S.
Urine (Horse's).

**243. SALIVATION:—**

Acacia catechu.
Bauhinia variegata.

Feronia elephantum.
Mimusops E.
Spilanthus O.

**244. SCABIS:—(Pama-Katchhoo) See "Itches" & "Skin Diseases".**

**245. SCALDS:—See also:— "Burns", "Blisters".**

Basella A.
Gossypium I.
Mangifera I.
Oryza S.
Portulaca species.
Sesamum I.
Silicium salts.
Terminalia cheb.
Triticum S.

**246. SCIATICA: (Gridhrasee):**

Abrus precatorius.
Allium S.
*Ashtakatvara Taila.*
*Bala Taila.*
Brassica N.
Caryophyllus aromaticus.
Cassia T.
Cervus dama.
Citrullus colocynthis.
Citruc B. C. & L.
Cucumis colocynthis (*P.H.T.*).
Datura A. & F.
Euphorbia R.
Gaultheria F.
*Ithrphal*
*Masha-baladi.*
Myristica M.
Nyctanthes A.
Piper longum.
*Prabhanjana Vimardhana.*
*Saindhavadya Taila.*
Semecarpus anacardium.
*Svalparasuna Pinda.*
Viscum album. (*P.H.T.*).

**247. SCROFULA: (Ganda-mala-apachi) (See also:—Consumption):—**

Amaranthus Pani.
Balsamodendron Mukul.
(also tumours):—
Bauhinia T. & V.
Caesalpinia D.
Clerodendron Inerme, & siphonanthus.
Cocculus C.
Echinops F.
Eulophia V.
(ulcers):—
Euphorbia A.
Evolvulus A.
Fumaria O.
Galega P.
*Gandhaka Lepa.*
Gracilaria L.
Gynocardia O.
Hydnocarpus I. & W.
Hydrocotyle A.
*Kanchanara guggula.*
Melia Azadi and Azeda.
Moringa P.
Myrica N.
Rumex C.
Semecarpus A.
Siegesbeckia O. etc.
Smilax China.
Solanum D.
(abscesses):—
Squalus C. preparations.
Sulphur and its preparations.
Trigonella F.
*Tryushanadi Lauha.*
(sores):—
Vitex N. etc.
Withania S. etc.
Xanthium S. etc.
Zinc salts and preparations.

**248. SCURVY:—(Sosham).**

Allium cepa.
*Ambose.*

*Amchur.*
Citrus Au. & B.
Feronia F.
Garcinia Pur.
Indigofera E.
Mangifera I.
Nyctanthes A.
Musa S.
Portulaca species.
Psidium G.
Raphanus S.
Rourea S.
Rumex C.
Salvadora species.
Solanum T.
Spondias M. etc.
Tamarindus I.
(locally): —
*Vasachandanadi Taila.*
Vitis Q. etc.

**249. SEA-SICKNESS:**

Cocculus indicus (*P.H.T.*).

**250. SENILITY:—**

Anacardium orientale & occidentale. (*P.H.T.*).

**251. SHOCK:—**

Hypericum perforatum, (*P.H.T.*).

**252. SINUS:—(Nadivrana):—**

Allium sativum.
Calotropis gigantea.
Cupri sulphas.
Jatropha G.
Myrtus C.
Plumbago Zeylanica.
Vitex N. etc.

**253. SKIN DISEASES:—**

Acacia C.
Alangium D.
Altingia E.
Andrographis paniculata.
*Balsam of sulphur.*
*Banga bhasma.*
*Brihat Somaraji Taila.*
Calotropis gigantea.
Cassia tora.
Cedrus deodara.
Cera flava.
*Chakramardha.*
*Chaulmugra Ointment.*
(Chilblains): —
Cinnabar.
Citrus B.
Cocculus C.
Piper nigrum.
Shorea R.
(freckles): —
Cocos N.
Cucumis Melo.
Gossypium I.
Mallotus P.
Curcuma Am. & Aro., L. & Z.
Cuscuta R.
Embelia R.
(chronic): —
Eucalyptus G.
*Panchatikta Ghrita.*
*Silicium salts.*
Sulphur and its preparations.
Taraxacum O. etc.
Urine (cow's) and preparations.
Vernonia A. & C. etc.
Ficus R.
Fumeria O.
*Gandha Taila or Gandhakadi Taila.*
*Gandhaka Ghrita.*
*Gandhaka Rasayana.*
Gloriosa S.
(measles).
*Gorochanam.*
Guazuma T.
*Guduchyadi Taila.*
Gynocardia O.
*Haridrakhanda.*
Hemidesmus I.
(scabies): —
Hibiscus P.

Terminalia Cat. etc.
Hydnocarpus I. & wightiana.
Hydrocotyle A.
Ichnocarpus F.
Indigofera A. & Tinc.
Ipomoea Cy.
Jasminum G.
*Kanchanara guggula.*
*Karaviradya Taila.*
*Khadirarishta.*
*Khadirashtaka.*
Lawsonia A.
Mallotus P.
Melia Azadi, and Azeda.
Mesua F.
*Milk of Sulphur.*
Nelumbium S.
Nerium O.
Nigella S.
*Nirgundi Oil.*
Nyctanthes A.
(excessive sweating):—
Ochrocarpus L.
Ocimum species.
(Inflammatory affections):—
Oryza S.
Zinc salts and preparations.
(excrescences):—
Oxalis C.
(irritable surface):—
Plantago I.
Plumbago species.
Plumbum and its salts.
Pongamia G.
(eruptions):—
*Lait virginal*. (Tincture of Benzoin).
Portulaca species.
*Prithvisara Taila.*
Prunus Amyg.
Rumex C.
Santalum A.
Sesbania species.
(eruptive):—
*Prithvisara Taila.*
Styrax B.
Psoralia C.
Pterocarpus M. & Santalinus.
(obstinate):—
*Ramaban Rasa.*
Rhus S.
(burning of skin and body heat):—
Rosa species.
Rourea S.
Rubia C.
Santalum A.
Saussurea L.
Sesamum I.
(excoriations, cracks, fissures, etc.):—
Sevum preparatum.
Shorea R.
parasitic eruptions):—
Siegesbeckia O. etc.
*Sinduradya Taila.*
Sodium salts and preparations.
Solanum D. & N.
*Somaraji Taila.*
Sphaeranththus H. etc.
Squalus C. preparations.
Stannum preparations.
Sulphur and its preparations.
Tabernamontana species.
*Talakesari Rasa.*
(locally):—
*Tamra Bhasma.*
*Tamresvara.*
Terminalia A. Cat. & cheb.
Tinospora cordifolia.
Trichosanthes species.
(tetter and lesions).
Triticum S.
Urginia I. etc.
*Utpaladi Sritam.*
*Vata guduchyadi Taila.*
(Syphilitic):—
Vitex N. etc.
*Vrihat guduchyadi Taila.*
Withania S. etc.
Zinc salts and preparations.
Zingiber Z.

**254. SLEEPLESSNESS:—**
**See "Insomnia".**

**255. SMALL POX:—**
**(Massoorika; Masurika).**
Agati G.
Asparagus R.
Curcuma L.
Fagonia A.
*Gorochanam.*
Lens E.
Melia azadirachta.
Plumbum and its salts.
Rhus-tox. (*P.H.T.*).
Trichosanthes dioica.
Trigonella-foenum-graecum.

256. SNAKE-BITES:—
Althanea O.
Amaranthus Poly.
Dodonaea V.
Eclipta E.
Euphorbia N. & T.
Flacourtia S.
Gardenia F.
Gloriosa S.
Gymnema S.
Heliotropium E.
Hibiscus A.
Hugonia M.
(Phursa):—
Nerium O.
Ophiorrhiza M.
Pericampylus I.
Salvadora species.
Strychnos N.

**257. SORE EYES:—See:—**
**"Eye Diseases".**

**258. SORES: (Bed sores and sores on lips).**
Acacia arabica & catechu.
Acalypha indica.
Aconitum ferox & A. nepellus.
Areca C.
(Delhi):—
Balsamodendron M.
Beta V.
Bisulphuret of arsenic.
Borax.
Caryophullus aromaticus.
Cassia O.
Cephalandra I.
Cleome V.
Crocus S.
Erythrina I.
Feronia elephantum.
Ficus glomerata.
Glycyrrhiza glabra.
Heliotropium I. & S.
Hibiscus P.
(phagedenic and foul):—
Hydnocarpus I.
Ixora C.
*Kaphaketu Rasa.*
Mangifera S.
Mentha S.
Moringa pterygosperma.
Musa paradisiaca.
(irritable):—
Prunus Amyg.
Pterocarpus M.
(gangrenous):—
Siegesbeckia O. etc.
Smilax glabra.
*Talisadya Churna.*
Tamarindus indica.
Terminalia balerica &
T. chebula.
Vitex N. etc.
(in ears and nostrils):—
Trichosanthes species.
(foetid and scrofulous):—
Vitex N. etc.

**259. SORE THROAT:—**
**(See also: "Cough").**
Acacia A. & C.
Allium C.
Alpinia officinarum.
Alstonia S.
Alumina (*P.H.T.*)
Balsamodendron My.

Borax.
Brassica oleracea (*P.H.T.*)
Capsicum A.
Caryophullus aromaticus.
Coriandrum S.
Curcuma longa.
Elettaria cardamomum.
Eugenia J.
Feronia E.
Glycyrrhiza G.
Ixora C.
Piper cubeba & Piper nigrum.
Pyrethrum radix.
(sore mouth and tongue):—
Pistacia species.
(relaxed):—
Punica G.
Quercus I.
(chronic):—
Pyrus species.
Rosa species.
Spinacea O.
*Talisadya Churna.*
Tamarindus I.
Terminalia B. & C.

**260. SPASMS:—**

Cajuputum.
(Melaleuca leucadendron). (*P.H.T.*)

**261. SPERMATORRHOEA: (Indriyaskalanam; (Sukrameha):—**

Aconitum ferox.
Adamas.
Aegle marmelos.
Albizzia lebbek.
*Banga Bhasma.*
Cassia Auri.
Cinnamomum camphora.
Digitalis 3 X. (*P.H.T.*)
Ficus B.
Holostemma R.
Ipomoea digitata.
Lactuca S.
Lawsonia A.
*Makaradhvaja.*
Mucuna P.
Parmelia P.
Pedalium M.
Plumbum reduced.
Saccharum O.
Sida C.
Stannum preparations.
Strychnos N.
*Swarna banga.*
Terminalia A. etc.
Tribulus T.
Withania S. etc.

**262. SPLEEN COMPLAINTS: (Enlargement; Plihodar; Pleehavriddhi):—**

*Abhaya Lavana.*
*Abhra Bhasma.*
Abies W.
Allium C.
Berberis asiatica.
Bombax malabaricum.
Calotropis gigantea.
Capsicum (*P.H.T.*)
Chicorium I.
Cimicifuga (*P.H.T.*)
Cinchona C.
Citrus B.
*Cowrie Bhasma.*
Eclipta A.
Eugenia J.
Euphorbia N.
Ficus A.
Flacourtia R.
Gardenia G.
Gentiana K.
Gymnema S.
Hermodactylus G.
Ipomoea D.
Jatropha G.
Lawsonia A.
Luffa A. & E.
Melia Azeda.
Moringa P.

Ostrea E. and its preparations.
*Panchakola Churnam.*
Piper Chaba & P. longum.
Potassium salts.
Prunus Amyg.
Punica G.
Pyrethrum I.
Quinetum.
Saline substances.
Salvadora species.
Semecarpus A.
Sesbania species.
Solanum I. & N.
Sulphur and preparations.
Swertia C. etc.
Terminalia cheb.
Trigonella F.
Viscum species.
Vitex N. & T.
Aloe L.
Cocculus C.
(induration):—
Hyssopus O.
*Jvarasani Rasa.*
*Kapardaka Bhasma.*
*Rohitaka Lauha.*
*Sambuka Bhasma.*
*Shanka Bhasma.*
*Sukti Bhasma.*
*Yakridari Lauha.*
(torpid):—
Prunus Amyg.

**263. SPLENITIS:—**

**See: "Spleen Complaints".**

**264. SPRAINS:—**

**(See also: Anti-phlogistics).**

Aplotaxis auriculata.
Cicer A.
Croton O.
Curcuma Aro. & Curcuma longa.
Garcenia P.
Gynandropsis P.
Hibiscus P.
Myristica F.
Paeonia E.
Papaver S.
Plumbum and its salts.
Vitex T.
Zingiber officinale.

**265. SPRUE: (Grahani):—**

Aegle marmelos.
Butter-milk.
Citrus aurantium.
Holerrhena A.
Musa S.
Oleum ricini.
Punica granatum.
Terminalia A.

**266. STAMMERING:—**

Spilanthus O.

**267. STERILITY:—**

Asparagus R.
Ficus R.
Mimusops E.
Pandanus O.
*Phalaghrita.*
Putranjiva R.
Withania S. etc.

**268. STIFF-NECK: (Manyastambha):—**

Asparagus R.
*Mashabaladi Kvatha.*

**269. STINGS:—**

**See: "Bites".**

**270. STOMACH COMPLAINTS: (Udara-roga):**

**See also: "Dropsy".**

*Kalyanakshram.*
(gastrodynia):—
Ipomoea turpethum.
Nardostachys J.
(gripes):—
Nicotiana T.

(irritability):—
Ochrocarpus L.
Ocimum species.
Santalum A.
(Inflammatory):—
Oryza S.
(ache):—
Cuscuta R.
Zingiber O.
(catarrh):—
Phaseolus species.
(disorders):—
Quinetum.

**271. STOMATITIS: (Mukhapaka; Mukharoga; Asyapakam):—**

Balsamodendron My.
Diospyros E.
Emblica O.
(parasitic):—
Sodium salts and preparations.
*Svalpa Khadira vatika.*

**272. STONE IN THE BLADDER:—**

**See: "Calculi".**

**273. STRANGURY: (Muthrakrichchra; Mutrakrachha): See also: "Ardor Urinae", Dysuria.**

Abutilon I.
Allium C.
Amaranthus Pani.
Boerhavia D.
Bombax M.
Citrullus V.
Clitoria T.
Cucumis S.
Erythrina I.
Gossypium I.
Hemidesmus I.
Hibiscus Rosa S. & Sab.
Linum U.
Oxalis C.
*Punarnava Leha.*
Saccharum O.
Scilla I.
Sida C.
Vernonia C. etc.

**274. SUNSTROKE: (Suryabhigatajanya moorcha):—**

Cucumis S.

**175. SWEATING:—**

(excessive):—
Ochrocarpus L.
(profuse):—
Santalum A.

**276. SWELLINGS:—**

Kaemferia R.
(hands and feet):—
Nigella S.
Ocimum species.
Plantago I.

**277. SYNCOPE: (Murccha-Bhrama):—**

**See: "Fainting", "Coma".**

**278. SYNOVITIS: (Kroshtrukshirsh; Kroshtuka-seersham):—**

**(See also: "Rheumatism").**

**279. SYPHILIS: (Firanga-roga; Phirangi-rogam):—**

Acacia catechu.
Acalypha I.
Adansonia D.
Agave A.
Alangium D.
*Amrita guggula.*
Andrographis paniculata.
Argemone M.
Argyreia speciosa.
Arsenious acid.
Balsamodendron M.
Berberis asiatica.
Bryonia E.

Calotropis G.
Cassia tora.
*Chandrodaya Rasa.*
Clerodendron inerme.
(secondary): —
Cocculus C.
*Devadari-kvatha.*
Gynocardia O.
Plumbago species.
Vanda R.
(cachexia): —
Cocculus V.
*Davakusumadi Rasa.*
Delphinium D.
Dioscorea B.
Echinops E.
Eclipta E.
Ephedra V.
Erythrina F.
Evolvulus A.
Ficus glomerata.
Fumaria O.
Hemidesmus I.
Hydrocoytle A.
Ichnocarpus F.
Indigofera A.
*Kaisara guggula.*
*Kanchanara guggula.*
Melia Azadi.
Moschus moschiferous.
*Narasimha Churna.*
Smilax C. etc.
(eruptions): —
*Nirgundi Oil.*
*Rasa-karpur.*
Rourea S.
Rumex C.
*Salvarsan.*
*Saptasali Vati.*
Semecarpus A.
Siegesbeckia O. etc.
Silicium salts.
Smilax glabra.
Solanum D.
*Somala Bhasma.*
*Suvarna.*
*Vasanta Malti.*
*Triphala guggula.*
(syphilitic rheumatism): —
Tylophora A.
*Vatari guggula.*
Vitex N. etc.
Zinc salts and preparations.

**280. TAENIA:—**

Beninkasa C.
Gisekia P.
Gynocardia O.
Mallotus P.

**281. TAILOR'S CRAMPS:—**

Anagallis arvensis *(P.H.T.)*

**282. TENESMUS:—**

Gossypium I.
Sida C.

**283. TETANUS: (Akshepaka-vatham; Dhanustambha):— (See: Paralysis & Rheumatism).**

Datura fastuosa.
Eclipta E.
Hypericum perforatum *(P.H.T.)*
*Narayana Taila.*
Nicotiana T.

**284. THIRST: (Trashna; Trishna):—**

(in fevers): —
Andropogon Muricatus.
Coriandrum sativum.
Cyperus rotundus.
Glycyrrhiza glabra.
Kyllingia T.
Mollugo cerviana.
Pterocarpus santalinus.
Punica granatum.

**285. THROAT AFFECTIONS: (Kantharoga):— See also: "Sore Throat".**

Altingia E.

Feronia E.
Hordeum V.
Pandanus O.
Rosa species.
Zingiber O.
(pectoral complaints):—
Zizyphus J. etc.

**286. THRUSH:—**

Sodium salts and preparations.

**287. TOBACCO CRAVING:—**

Plantago Major (*P.H.T.*)

**288. TONSILLITIS: (Galagraha; Kanthashalooka):—**

(acute):—
Cinchona C.
Garcinia M.
Phyllanthus species.
Piper betle.
(enlarged tonsils):—
Quercus I.
Rosa species.

**289. TOOTH COMPLAINTS: (Dantaroga):—**

Argemone M.
Calotropis gigantea.
Caryophyllus aromaticus.
Cinnamomum C.
Datura A.
Delphinium D.
Embelia R.
Erythrina I.
Euphorbia A. & Tir.
Ferula A.
Ficus B. & G.
Gardenia G.
Holarrhena A.
(loose teeth):—
Mimusops E.
(caries):—
Moringa P.
Myrica sapida.
Myristica M.
Ochrocarpus L.
Paederia E.
Papaver S.
Pistacia species.
(ache):—
Arsenic (*P.H.T.*)
Pistacia species.
Piper species.
(toothache):—
Plantago (*P.H.T.*)
Pterocarpus M.
Rumex C.
Sinapis J.
Solanum I.
Spilanthus O.
Tabernamontana species.
Xanthoxylum species.
(Cleansing of teeth):—
Salt-water (*P.H.T.*)
(to strengthen teeth and gums):—
Salvadora species.
(teething among children):— (*Dantodbheda*).
Saxifraga L.
Zingiber officinale.

**290. TRACHOMA:—**

Abrus precatorius (infusion for instillation).

**291. TUBERCULOSIS: (Rajayakshma):— See: "Phthisis"; consumption, etc.)**

**292. TUMOURS: (Gulma):—**

(malignant):—
Anona S.
(scrofulous):—
Bauhinia T. & V.
Carbonate of Potash.
(cheloid):—
Cassia T.
Fagonia A.
Ipomoea turpethum.
(abdominal):—
Ostrea E. and its preparations.

Plumbago Zeylanica.
Saline substances.
Papaver S.
Salvadora species.
Saraca indica.
*Sarjikadya Churna.*
Saussurea L.
Semecarpus anacardium.
Sphaeranthus H. & I.
Symplocos racemosa.

**293. TYMPANITIS:**

**(Adhmanam; Anaham):—**
**(See also: "Ear-ache").**

Carpum copticum.

**294. TYPHOID FEVER:**

**(Sannipatha-jwaram; Pralapak):—**

**See also: "Fevers".**

(for Diarrhoea):—
Alumina (*P.H.T.*)
*Anandabhairava Rasa.*
Artemesia absenthium (*P.H.T.*)
Cinnamomum zeylanicum.
Coffea Arabica (*P.H.T.*)
Ferula asafoetida.
Oxalis C.
Sodium salts and preparations.
*Svalpa-kasturi-bhairabi Rasa.*

**295. TYPHUS FEVER:—**

Gynandropsis P.

**296. ULCERS: (Vrina; Vranam):—**

**See also: "Antiseptics"; "Sores"; "Wounds".**

Acacia Arabica & A. catechu.
Allium sativum.
Andrographis paniculata.
Aplotaxis auriculata.
Balsamodendron M. and O.
Bambusa A.
Bisulphurate of arsenic.
Bombax malabaricum.
Borassus F.
Boswellia G.
Calotropis G.
Capparis A.
Careya A.
Carthamus T.
Cassia O.

(foul):—
Cassia T.
Cera flava.
Cinnamomum camphora.
Cocculus S.
Cuprum sulphas.
Eucalyptus G.
Euphatorium A.
Gardenia G.
Glycyrrhiza glabra.
Holarrhena A.
Melia Azadi.
Pongamia G.
Saccharum O.
Styrax B.
Woodfordia F.
Cedrus D.
Curcuma L.
Cyperus R.
Diospyros M.
Dipterocarpus T.
Eucalyptus G.

(scrofulous):—
Euphorbia A. & N.
Execaria A.
Geranium maculátum (*P.H.T.*)

(indolent):—
Ferri sulphas.
Ferula O.
Ghee.
Lens E.
Lippia N.
Mel depuratum.

(gastric):—
(*Sulam; Parinama Sulam*).
Olive Oil (*P.H.T.*)
Styrax B.
Tamarindus I.

Terminalia T. etc.
Ficus R.
Galega P.
Garcinia Pur.
Gossypium I.
Hemidesmus I.
} for ordinary ulcers.
(chronic): —
Jatropha G.
Terminalia cheb.
(small-pox): —
Lens E.
Mangifera S.
(from burns): —
*Manjishtadya Ghrita.*
Myrica sapida.
Myristica M.
Myrtus C.
(gastric and duodenal): —
*(Parinama Sulam).*
Oryza S.
(plain and irritable): —
Papaver S.
Pedalium M.
Phosphorus (*P.H.T.*)
Phyllanthus species.
Pinus species.
Piper betle.
Plantago ispagula.
Plumbago zeylanica.
Plumbum reduced.
Pongamia glabra.
*Prithvisara Taila.*
Punica G.
Rourea S.
Rubia C.
Santalum album.
Saussurea L.
Sesamum I.
*Shankha Bhasma.*
Shorea R.
(syphilitic): —
Adansonia D.
Nerium O.
Silicium salts.
(sloughing): —
Sodium salts and preparations.
Symplocos racemosa.
Squalus C. preparations.
Tamarix G.
Terminalia A. & C. etc.
Trichosanthes species.
(hollow): —
*Triphala.*
*Triphala guggula.*
Triticum S.
Vateria I. etc.
(obstinate): —
Vitex Negundo.
Withania S. etc.
Woodfordia floribunda.
Zizyphus J. etc.

**297. URETHRAL DISEASES:**

Cordia myxa.
Elephantopus S.
Hibiscus P.
(urethritis): —
Pinus species.
Pongamia G.
*Prameha Mihira Taila.*
Sodium salts and preparations.
Siegesbeckia O. etc.

**298. URIC ACID DIATHESIS: (Sikatameha):— See "Gout".**

**299. URINARY COMPLAINTS: (Prameham; Prameha Pitakas):— See also: "Anuria; Enuresis; Diabetes, Dropsy; Nephritis; Gonorrhoea; etc.**

Althaea O. (for irritability).
(dribbling of urine in old men): —
Benzoic Acid (*P.H.T.*)
*Changeri Ghrita.*
Potassium salts.
*Prameha Mihira Taila.*
Ricinis C.
Strychnos P.
Vitex N. etc.

Zea M. etc.
Cissampelos P.
Cocculus C.
Cocos N.
(genital): —
Coriandrum S.
Cucumis Melo & S.
Cucurbita M.
*Gochuradi* (or *Gochurathi*) *Churnam.*
*Gokshuradyava Leha.*
Grewia W.
Hedysarum A.
Hemidesmus I.
Herpestis M.
(catarrh): —
Hordeum V.
Hyoscyamus N.
Malva S.
Pistacia species.
(polyuria): —
*Laboobai Saghur.*
*Mehamudgara Rasa.*
Melia Azadi.
Mimosa P.
Pedalium M.
Physalis species.
Portulacca species.
(painful): —
Prurus Amyg.
Raphanus S.
Rhus aromatica for anuria & enuresis (*P.H.T.*)
Senna for oxaluria (*P.H.T.*)
Saccharum O.
Sodium salts and preparations.
(scalding urine):—
Sida R.
Tamarindus I.
(calculi): —
Spinacea O.
(retention): (*Mutraghatam*):
Strychnos N.
(incontinence):—
(*Mootrasangam*).
Aconitum ferox.
*Majoonai Kuvathiabah.*
Pedalium murex.
Strychnos N.
Styrax B.
*Sulachanamritabhra.*
Terminalia cheb.
(bloody urine): —
Tribulus T.

**300. URTICARIA:**

**(Seetapitta; Shithapitha):—**

Apis (*P.H.T.*)
*Ardraka-khanda.*
Curcuma L.
*Haridrakhanda.*
Ptychotis ajowan.
Zingiber officinale.

**301. UTERINE DISEASES:—**

**(See: "Menstrual disorders"; Menorrhagia; Dysmenorrhoea; Amenorrhoea and "Abortifacients"):—**

Andropogon Muricatus.
*Asoka Ghrita.*
Aurum muriaticum natronatum (*P.H.T.*)
Bombax malabaricum.
Coccus lacca.
Crocus S.
Cuminum cyminum.
(menstrual derangement): —
Curculigo O.
Dolichos Bif.
(haemorrhages): —
Eclipta E.
(during gestation): —
*Utpaladi Sritam.*
(catarrh): —
Ferula foetida & F. & G.
Urtica D.
(discharges): —
Glycyrrhiza G.
Gossypium I.
Grangea M.
Holerrhena A.
Punica G.

Styrax B.
(prolapsus):—
Hypericum P.
Myrtus C.
Nigella S.
Paeonia E.
Papaver S.
Pedalium M.
Peterosalinum S.
(irritability):—
Potassium salts.
Punica G.
(painful affections of uterus):
Pessaries of saffron (*P.H.T.*)
Saraca I.
Symplocos R.
Tribulus T.
Viburnam F.

**302. UVULA: (Elongation):—**

Allium S.
(uvulitis):—
Phyllanthus species.
(relaxed):—
Acacia catechu.
Symplocos R.

**303. VAGINISMUS:—**

Zingiber O.

**304. "VATA" DISEASES:—**

Allium sativum.
Alpinia officinarum.
Andrographis paniculata.
Cinnamomum camphora.
Ferula foetida.
Hydrargyrum.
Moschus moschiferus.
Piper longum & its root.
Sida cordifolia.
Solanum Xanthocarpum.
*Triphala.*
Vitex negundo.

**305. VENEREAL DISEASES: See also "Syphilis".**

Indigofera E.
Semecarpus A.

**306. VERTIGO: (Nandavayu; Murccha-Bhrama):—**

Ambra grisea (Ambergris) (*P.H.T.*)
Coriandrum S.
Nux vomica (*P.H.T.*)
Ruta (*P.H.T.*)

**307. VOICE: (To hold & to help singers):—**

Mentha piperita (*P.H.T.*)

**308. VOMITING: (Chardi; Chhardhi):—**

**See also: Indigestion.**

Abies Webbiana.
Aconitum heterophyllum.
Acorus calamus.
Andropogon muricatus.
Bergera K.
Brassica A.
Cinnamomum C. & F.
Citrus B. & L.
Cyperus R.
Elettaria cardamomum.
Hemidesmus I.
Mentha P.
(bilious):—
Mentha S.
Mollugo cerviana.
Myristica fragrans.
Nardostachys jatamansi.
Plumbum and its salts.
Tamarindus indica.
(obstinate):—
Silicium salts.
Sinapis J.
Terminalia Cheb.
Zingiber O.

**309. WARTS: (Masaka; Mashak):—**

**See also: Corns.**

Achyranthes aspera.
Anacardium O.
Carica P.
Euphorbia A.
Jasminum G.
Mangifera indica.
Oxalis C.
Semecarpus A.
Urginia I. etc.
White cabbage (*P.H.T.*)

**310. WHITE ANTS:—**

Melia Azadi.

**311. WHITLOWS:—**

Apis (*P.H.T.*)
Crinum D.
Dioscorea (*P.H.T.*)
Euphorbia A.
Nitric acid (*P.H.T.*)
Ordinary lemon (*P.H.T.*)
Sulphur 200 (*P.H.T.*)

**312. WHOOPING COUGH:—**

Allium cepa.
Alum (*P.H.T.*)
Cannabis S.
Ephedra vulgaris.
Eucalyptus G.
Euphorbia N. & Tir.
Ferula A.
*Gorochanam.*
Indigofera T.
Justice adhatoda.
Opuntia dillenii.
Lemonade (*P.H.T.*)
Pongamia G.
Sinapis J.
Sulphur fumes.
Tylophora A.
Zinc salts and preparations.

**313. WOMB DISEASES:—**
**See: "Uterine Diseases".**

314 WORMS: (Krimi):—

Acalypha I.
Acorus C.
Aleurites M.
Alocasia I.
Aloe B.
Alstonia S.
Andropogon C.
Aristolochia B.
Artemesia A.
Bauhinia V.
Blumea B.
Boerhavia diffusa.
Butea frondosa.
Dillenia I.
Embelia R.
Potassium salts.
(round & tape):—
Areca C.
(tape):—
Ammonium embelate.
Argemone M.
Cocos N.
Cucurbita M.
Garcinia P.
*Kamala powder.*
Mallotus P.
Punica G.
(thread):—
Bambusa A.
Gisekia P.
Quassia E.
Sodium salts and preparations.
(round):—
Allium S.
*Bhoonimbadi Churnam.*
Carica P.
Cleome V.
Colycopterus F.
Cyperus P.
Ferula asafoetida (*P.H.T.*)
Gardenia G.
Gynandropsis P.

Hyssopus O.
Mangifera I.
Mucuna P.
Vernonia A.
(ankylostoma): —
Ceropegia B.
Citrus A.
Cyperus R.
Daemia E.
Spinacea O.
(guinea): —
Anona squamosa.
Carica papaya.
Datura A.
Vernonia C. etc.
Eclipta E.
Emblica O.
Etrythrina I.
Eulophia V.
Gloriosa S.
Holarrhena A.
Melia Azadi.
Saline substances.
Sida A.
Sodium salts and preparations.
Urine (horse's).
Euphorbia T.
Ferula A.
Helleborus N.
(round and thread): —
Embelia ribes.
Holarrhena A.
*Kitamarda Rasa.*
*Krimighatini gutika.*
*Krimimudgara Rasa.*
Luffa E.
Mallotus P.
Melia azadirachta.
Moringa P.
Nigella S.
Nyctanthes arbortristis.
Picrorrhiza kurrooa.
Piper species.
Ptychotis A.
Pyrethrum I.
Quassia E.
Ruta G.
Sapindas T.
Semecarpus anacardium.
Sesbania species.
Solanum I.
Spaeranthus H.
Stannum (*P.H.T.*)
Strychnos N.
Sulphur and its preparations.
Tabernamontana species.
Terminalia cheb.
Trichosanthus species.
Urine (Ox's).
Vernonia C. etc.
(haematinic): —
*Vidanga Lauha.*
Vitex N. etc.
Zingiber Z.
(Hook worms): —
Thymol (*P.H.T.*)
(all kinds of worms, trichinosis, tapeworms): —
Cuprum oxydatum nigrum ix (*P.H.T.*)
(Seat worms)
Urtica Urens (*P.H.T.*)

315. WOUNDS: (Salbovrana; Sadyovrana).

Acacia catechu.
Acalpha indica.
Acorus calamus.
Agave Americana (*P.H.T.*)
Arum C.
Balsamodendron O.
Bombax malabaricum.
Borax.
Calotropis gigantea & C. procera.
Cupri sulphas.
Cynodon dactylon.
Cyperus rotundus.
Lactuca Scariola (*P.H.T.*)
Mel depuratum.
Saccharum officinarum.
Sida cordifolia.

(contusions and bruises):—
Coscinum F.
Crocus S.
Curcuma Aro. & Z.
Ferula foetida.
Papaver S.
Plumbum and its salts.
Symplocos racemosa.
Terminalia A. etc.
Desmodium T.
Fagonia A.
*Friar's Balsam.*
Ghee.
(bruises):—
Garcinia P.
Hibiscus P.
Mentha S.
Paeonia E.
Potassium salts.
(maggots):—
Hydnocarpus I.
Kaempferia R.
Oryza S.
(abrasions):—
Potassium salts.
Saussurea L.
Sesamum I.
Zinc salts and preparations.
(caused by poisoned arrows):
Spondias M. etc.
Sterculia A.
(cuts):—
Styrax B.
Woodfordia F.
Zinc salts and preparations.

**316. WRITER'S CRAMPS:—**

Ambra grisea (Ambergris). (*P.H.T.*)

*Publications referred:*—

(1) Clinical Application of Ayurvedic Remedies, (1924) by Zandu Pharmaceutical Works, Ltd., Bombay.

(2) Fundamental Principles of Ayurvedic Medicine, by Government of Madras, Madras.

(3) One Hundred Useful Drugs (1927), by Dr. A. Lakshmipathi.

(4) Pharmacopoeia Indica (1932), by Dr. K. C. Bose.

(5) Practical Homoeo Therapeutics (1950), by Dr. Ghoshal.

(6) Prospectus of the Government Ayurvedic and Unani College, (1937), Mysore.

(7) Vegetable Drugs of India (1924), by Dr. D.J. Sanyal.

26

## APPENDIX IV

### Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles | Average percentage of: Proteins or flesh formers | Fats & Starch or Heat givers. (Carbohydrates) | Mineral matters or salts (Ash constituents) | Watery or refuse matters | Calories per lb. | Percentage of total nutriment | Hours required for digestion (Approximate) |
|---|---|---|---|---|---|---|---|
| Almonds .. .. | 20.75/49.75. | 72.2. | 2. | 4.8/ 6.2. | 1912/ 3030. | 87. | 2½. |
| Apples .. | 0.31/1.2. | 13.5. | 0.3. | 84.8. | 275/290. | 13.7. | 2¾. |
| Apricots .. | 1. | 13.5. | 0.5. | 81.2 | 270/300. | 13.5. | 2¾. |
| Apricots, dried .. | 5.51. | 49.92. | .. | .. | 1008. | .. | .. |
| Arrow-root .. | 4. | 82. | 1. | 13/16.51. | 1600. | .. | .. |
| Artichoke .. | 2.75. | 17.88. | .. | .. | 384. | .. | .. |
| Asparagus .. | 2.2. | 3.9. | .. | 93.7. | 120/250. | 5.4. | 2¼. |
| 'Atta', see Flour, whole wheat | | | | | | | |
| Bacon .. | 10/17.66. | 53.0. | .. | .. | 2480. | .. | .. |
| Bajri .. | 10. | 73. | 2. | 12/15. | .. | .. | .. |
| Bananas .. | 1.33. | 22.6. | 0.8. | 73/75. | 350/460. | 26.7. | 3. |
| Barley, Pearl .. | 7.4/11.47. | 72. | 2.4. | 14. | 1250. | 90/92. | 2/4. |
| Barley, whole grain .. | 10.21. | 77. | 1.2. | 12/16. | 1500/ 2780. | 84. | 2/3¾. |
| Beans .. | 23/25. | 60.1. | 2.9. | 14/15. | 1520. | 78.5. | 3. |
| Beans, Kidney or French | 1.74. | 4.90. | .. | 91.43. | 750/128. | 85.2. | 3. |

# APPENDIX IV

## Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles | Average percentage of Proteins or flesh formers | Fats & Starch or Heat givers (Carbohydrates) | Mineral matters or salts (Ash constituents) | Watery or refuse matters | Calories per lb. | Percentage of total nutriment | Hours required for digestion (Approximate) |
|---|---|---|---|---|---|---|---|
| Beans, Lima or broad beans | 7.5. | 23.5. | .. | 66.5. | 600. | 87. | 2½. |
| Beef-fat & Mutton-fat .. | 1.2. | 93.28. | .. | .. | 3824. | .. | .. |
| Beaf (lean) .. | 20.5/22.61. | 4/10. | 1.6. | 74.33. | 800/842. | .. | 3/4¼. |
| Beaf steak .. | 18.6. | 18.5. | .. | 61.9. | 1130. | .. | .. |
| Beets (Beetroot) .. | 1.65. | 9.6. | .. | 71.6 to 87.5 | 150/205. | 11.5/ 16.8. | 2¾. 3¾. |
| Beet tops .. | 2. | .. | .. | 86.4. | 250. | .. | 2½. |
| Biscuits .. | 9/15.6. | 74.7. | 1.7. | 8. | 1900. | .. | .. |
| Black berries .. | .. | .. | .. | 86.4. | 128/250. | .. | 2½. |
| Brain .. | 10.24. | 9.78. | .. | .. | 592. | .. | .. |
| Bran .. | 16. | 47. | 6. | .. | 1100. | .. | 2¾. |
| Bread (brown) .. | .. | .. | .. | .. | 1040. | .. | .. |
| Bread, wheaten (whole) | 8 to 9. | 53.45. | 1.3. | 40. | 1113/ 1200. | 81/90. | 3¾/4. |
| Breast milk (Human) .. | 1 to 2.4. | 10.2. | 0.4. | 89.1. | 288/1800. | .. | 1½. |
| Brinjal .. | 1.2/13.92. | 5.39. | .. | 91.49. | 128. | .. | .. |
| Brussels sprouts .. | 3.25. | 5.89. | .. | .. | 336. | .. | .. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Butter, clarified .. | 1. | 85/100. | .. | .. | 4706. | .. | 3½. |
| Butter (English) & American | 1/1.5. | 80.5. | 1. | 10 to 13.8. | 3400 to 3700. | .. | 3¼. |
| Butter-milk .. | 0.84/4. | 5. | 1. | 88/90. | 150. | 9.2. | 2¼. |
| Cabbage, cooked .. | .6. | .5. | 0.13 | 97.4. | .. | .. | .. |
| Cabbage, white, raw .. | 1/2. | 5/6. | 1.5. | 60/90. | 100/160. | 8/18.1. | 2½/4½. |
| Caltrops, water .. | 4. | 82. | 1. | 13. | .. | .. | .. |
| Carrots .. | 1.2. | 8/18.5. | 1. | 80.8 | 180/700. | 11.7. | 2¼/3¼. |
| Cauliflower .. | 1.9/3.51. | 7.5. | 0.8. | 93.3. | 80/100. | 14.5. | 3¼. |
| Celery .. | 2.1/5.97. | 3.8. | 0.8. | 90/92. | 150/170. | 8.2. | 2¼. |
| Celery root .. | .60. | 6.186. | .. | .. | 80/250. | .. | 3½. |
| Cereals, whole grain .. | .. | .. | .. | .. | 1800. | .. | 3. |
| Chapathi .. | 10. | 50.5. | .. | .. | 1000. | .. | 3. |
| Cheese .. | 24/28.8. | 42. | 2. | 28/35.1. | 980/2145 | 64. | 3¼/3½. |
| Chestnuts (fresh) .. | 6.6. | 53.3. | 1.7. | 38.5. | 3240. | 89.3. | .. |
| „ (dried) .. | 10.1. | 81.4. | 2.7. | 5.8. | | | |
| Chicken .. | 23.81. | 2/5. | 1.2. | 74.8. | 500/600. | 32. | 3¼. |
| Chicory .. | 1.6. | 2.9. | .. | 94.2. | 93. | .. | .. |
| Chocolate .. | .. | .. | .. | .. | 2900. | .. | 2. |
| Chouli (Barbati dal) .. | 24. | 59. | 3. | 14. | .. | .. | 2¾. |
| Cocoa .. | 21.6. | 66.6. | .. | .. | 2400. | .. | 2. |
| Cocoanut (fleshy part) | 5.2. | 47.2. | 1. | 46.6. | 2672. | .. | .. |
| „ (dried, natural) | 6/7. | 89.2. | 1.3. | 3.5. | 2800. | 50.5 | 3¼. |
| „ (milk) .. | 0.5. | 9. | 0. | 90.5. | 500. | .. | 2. |
| „ (water) .. | .. | .. | .. | .. | 80. | .. | .. |
| Cocoanut, fresh .. | 4.47. | .. | .. | 36.28. | 2000. | .. | .. |
| Cocoanut, Indian .. | 25.68. | | | 36.28. | .. | .. | .. |
| Cocoanut oil (vanaspati) | 1. | 85. | | .. | 3500. | .. | .. |

# APPENDIX IV

## Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles | Average percentage of: Proteins or flesh formers | Fats & Starch or Heat givers (Carbohydrates) | Mineral matters or salts (Ash constituents) | Watery or refuse matters | Calories per lb. | Percentage of total nutriment | Hours required for digestion (Approximate) |
|---|---|---|---|---|---|---|---|
| Cod-liver Oil .. | | 98.93. | | .. | 4032. | .. | 3. |
| Coffee .. | 3. | 28. | 10. | 12. | 1670/ | .. | .. |
| Corn flour or meal .. | 9.3. | 71.5. | 2. | 14.2 | 1800. | 82/91. | 3½. |
| Corn, sweet .. | | | 13.1 to 13.4. | 490 to | 83.7 to | .. | 3. |
| " dried .. | 20. | 57.5. | | 800. | 84.9. | | 2¾. |
| Cream (thick) .. | 2.47. | 29.5. | 1.8. | 66. | 900/1260. | 34/69. | 2½. |
| Cucumbers .. | .75/1.3. | 3.2. | 0.5. | 95.2. | 80/100. | 27.4. | 3¼. |
| Dahi (unsweetened) .. | .. | .. | .. | .. | 288. | .. | .. |
| Dal (Dhalls) .. | 22.96. | 60.73. | .. | 74.98. | 1600. | .. | .. |
| Dal (Soup, average) .. | .. | ... | .. | .. | 128 | .. | .. |
| Dates, dried .. | 3.24/4. | 69.8. | .. | 20. | 1440/1660 | .. | 2½. |
| Drum sticks .. | 2.53/6.65. | .. | .. | 74.98. | 1600. | .. | .. |
| Duck .. | 27.12. | 6.06. | 2.04. | 64.13. | 800. | .. | .. |
| Egg plant .. | 1.1. | 5.5. | .. | 92.7. | 130/150. | .. | 3½. |
| Eggs, white (hen) .. | 13.39. | 11.6. | 1.4. | 78/86. | 300/720. | 22/26. | 2¼/3½. |
| Egg, duck .. | .. | .. | .. | .. | 832. | .. | |
| Egg—yolk .. | 13.41/31. | 75. | 1.09. | 52. | 1700. | 48. | 2¼. |
| | 16.2. | | | | | | |
| | 6/12. | 57. | .. | 20. | 380/1400. | .. | 2½ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Figs, fresh .. | 12. | 10.8. | 0.6. | 79.1. | 350/700. | .. | 2¼ |
| Fish, average .. | 22/30. | 5. | 1. | 63. | 500/980. | 13/23. | 4. |
| Fish fat, (Fat fish) .. | 18.79. | 13.07. | .. | .. | 880. | .. | .. |
| Fish fresh-water (Fresh water fish) | 19.43. | 4.08. | .. | .. | 512. | .. | .. |
| Fish, Herrings, fresh .. | 10. | 8. | 2. | 80. | 1455. | 13/23. | 4. |
| Fish—Liver oil .. | .. | 98.93. | .. | .. | 4032. | .. | .. |
| Fish Non-fat (Non-fat fish) | 18.19. | 0.70. | .. | .. | 352. | .. | .. |
| Fish, Salmon .. | 15. | 7. | 2. | 76. | .. | .. | .. |
| Flour, average .. | 11. | 73. | 1. | 15. | 1616. | .. | .. |
| Flour, fine .. | 13.8. | 70. | .7. | 16.3. | 2700. | 120. | .. |
| Flour, white .. | 11.09. | 77.41. | .. | .. | 1632. | .. | 3. |
| Flour, whole, wheat (Atta) | 13.78/15. | 73. | .. | 11.6. | 1700. | .. | .. |
| Fowl .. | 24.26. | 6.68. | 1.37. | 67.4. | 1040. | .. | .. |
| Fruit, (dried)—average | 2. | 61. | .. | .. | 1500. | .. | .. |
| Garlic .. | 4.4/6.31. | 28. | .. | 62/74. | 200/650. | .. | 2. |
| Ghee.—See butter clarified | | | | | | | |
| Gooseberries .. | 1.78/3.1. | 8.9. | 2. | 81/86. | .. | .. | .. |
| Gourd .. | .. | .. | .. | .. | 128. | .. | .. |
| Gram, Bengal .. | 17.08/21.25. | 66. | 3. | 8/9.83. | 1536. | .. | .. |
| „ Black (Phaseol) | 23.95. | 62. | 3. | 10/13. | 1170. | .. | .. |
| „ Green (Mung dal) | 22.56. | 60. | 3. | 10/13. | 1600. | 14. | .. |
| „ Horse, or Gram Red | 20.62. | 61. | 3.7. | 12/15. | 1636. | .. | .. |
| Grape fruit .. | 0.95. | .. | .. | 88.51. | 200. | .. | 2. |
| Grapes .. | 1.30. | 3/4.1. | 0.5. | 78/83. | 2721. | 18.2. | .. |

# APPENDIX IV

## Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles | Average percentage of: Proteins or flesh formers | Fats & Starch or Heat givers (Carbohydrates) | Mineral matters or salts (Ash constituents) | Watery or refuse matters | Calories per lb. | Percentage of total nutriment | Hours required for digestion (Approximate) |
|---|---|---|---|---|---|---|---|
| Groundnut .. | 26.72/42.43. | 62.96. | 4. | 7/9. | 2490. | .. | .. |
| Guavas .. | 0.95/1.3. | 8.7. | 0.5. | 82/85. | 192/450. | .. | 3. |
| Halibut .. | .. | .. | .. | 51.60. | 450. | .. | 2½. |
| Ham .. | 14.5. | 35. | .. | .. | 1650. | .. | .. |
| Honey .. | .38. | 71.41. | Carbohydrate | 20.06. | 1606. | 79.4. | 2¼. |
| Horse radish .. | 3.2. | 21.4. | .. | 73.4. | 100/455. | .. | 4. |
| Infant foods (tinned) .. | 12.68. | 79.46. | .. | .. | 1744. | .. | .. |
| Jack fruit seeds .. | 6.60/15. | .. | .. | 51.60. | 450. | .. | 2½. |
| Jaggery (Goor) .. | .28. | 88.33. | Carbohydrate | .. | 1600. | .. | .. |
| Jams .. | .21/.5. | 70.65. | .. | .. | 1264. | .. | .. |
| Kidney .. | 16.04. | 4.80. | .. | .. | 496. | .. | .. |
| Kholrabi .. | .. | .. | .. | .. | 200. | .. | 3. |
| Ladies finger .. | 2.20/13.12. | 7.11. | .. | 87.95. | 192. | .. | .. |
| Lard .. | .. | 94.69. | .. | .. | 3856. | .. | .. |
| Leeks .. | 2.50. | 9.4. | | .. | 224. | .. | .. |
| Lemons .. | 0.98/1. | 3.5. | 7 acid. | 84.97. | 200/208. | .. | 1½. |
| Lentils .. | 24.25. | 60.2. | 4. | 8/12.3. | 1620/ /1700. | 83. | 3. |
| Lettuce .. | 1.2/2.05. | 2.9. | | 94.8. | 85/100. | 4.9. | 2¼. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lettuce (Salad) .. | | | | .. | 96. | | |
| Lichee .. | 2.96. | 6.95. | | .. | 192. | .. | .. |
| Linseed .. | 22.61. | 60.41. | | .. | 2272. | .. | .. |
| Liver .. | 2.687. | 6.10. | | .. | 688. | .. | .. |
| Maize (yellow) .. | 9.5. | 74. | 2. | 14/79.36 | 1639. | .. | .. |
| Mangoes .. | 1.02/1.8. | 19.4. | 0.5. | 85/90. | 220/450. | .. | 1¾. |
| Margarine .. | .. | 84.09. | | .. | 3424. | .. | .. |
| Marmalade .. | .21. | 68.58. | | .. | 1248. | .. | .. |
| Meat (goat's) .. | 25.44. | 2.65. | | .. | 560/950. | .. | .. |
| Meat (lean) .. | 22. | 14. | 1. | 63/72. | 715. | 28. | .. |
| Melons .. | .5. | 7. | | | 160. | .. | .. |
| Milk (Ass's) .. | 2.2. | 7.7. | 0.5 | 89.6. | .. | .. | .. |
| Milk (breast)— See breast, milk human | | | | | | | |
| „ (Buffalo's) .. | 4.5 to 6.1. | 12.5. | 0.9. | 81/82. | 500/600. | .. | .. |
| „ (Camel's) .. | 4. | 8.6. | 0.8. | 6.6. | 300. | 10.4. | 2¼. |
| „ (Cow's) .. | 3.68 to 5. | 4/8.5. | 1. | 86/87. | 300 to 400. | 14/22. | |
| „ (Cow's skimmed) | .. | .. | .. | 38. | 300. | 10.4. | 2¼. |
| „ (Cow's whole raw) | | | | | 1200 | .. | 2¼. |
| „ (curd) .. | 23. | 19. | 1. | 57. | .. | .. | .. |
| „ (Goat's) .. | 3.68 to 4.5. | 9.2. | 0.7. | 86.30. | 350 to 600. | .. | 2. |
| „ (Mare's) .. | 2.0. | 6.8. | 0.3. | 90.9. | .. | .. | .. |
| „ (Sheep's) .. | 7.1. | 9.6. | 1.0. | 82.3. | 480. | .. | .. |
| „ Skim powder) .. | 35.5. | 2.0. | .. | 3.0. | 1830. | .. | .. |
| „ (tinned, Swiss condensed) | 12. | 62.39. | 2. | 25. | 1500 to 1600. | .. | 4. |

# APPENDIX IV

## Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles. (1) | Average percentage of Proteins or flesh formers. | Fats & Starch or Heat givers (Carbohydrates) | Mineral matters or salts (Ash contituents). | Watery or refuse matters. | Calories per lb. | Percentage of total nutriment. | Hours required for digestion. (Approximate). |
|---|---|---|---|---|---|---|---|
| „ whole powder .. | 25.5. | 29.0. | .. | 4. | 2530. | .. | .. |
| Millet, Great (Jaware) .. | 9. | 74. | 1. | 16. | over 950. | 86.9. | 3¼. |
| „ little (kangni) .. | 12. | 70. | 1. | 17. | | | |
| Millet, spiked (See Bajri) | | | | | | | |
| Molasses .. | .. | 69.7. | 7. | .. | 1800. | .. | 2¼. |
| Mushrooms .. | .. | | | 91.1. | 200. | .. | 2½. |
| Musk Melons .. | 2.7. | 7.2. | 0.6. | 89/92. | 300/385. | .. | 3¼. |
| Mustard oil .. | .. | | | | 4/92. | .. | .. |
| Mutton (lean) .. | 19.8. | 15/18. | 1. | 66/71. | 863/ 1200. | 34. | 3¼. |
| Mutton fat .. | | | | | 3824. | .. | .. |
| Nolkole .. | .91. | 12.22. | .. | .. | 256. | .. | .. |
| Nuts (average) general | 10/20. | 50/71. | 1. | 4 to 5. | 3000. | .. | |
| Oatmeal .. | 13/15. | 78.58. | ... | 10/12. | 1840 to 1920. | 89. | 3½. |
| Oats .. | 11. | 69. | 3.5. | 12/17. | 1900. | 80. | 3¼. |
| Olive Oil | .. | 98.93. | .. | .. | 4032. | .. | 3¼. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Olives, dried | .. | .. | .. | .. | 800. | .. | 2. |
| Olives, ripe | .. | .. | .. | .. | 400. | .. | 1¾. |
| Onion | 1.22/2.1. | 7/10.3. | 0.61. | 86/89. | 200/220. | 13.3. | 3¼. |
| Oranges | 0.6/0.88. | 9.6 to 11.2. | 0.6. | 87/90. | 200/240. | .. | 2. |
| Papaya | .57. | .35. | .. | .. | 16/32. | .. | |
| Parsnips | 1.33. | 18.2. | 1. | 72/83. | 4.32. | 10/12. | 2½. |
| Peaches | 0.7. | 6.1. | .. | .. | .. | 190. | |
| Peaches, fresh | 1.52/4. | 9.5. | 1.5. | 80/88. | 192/200. | 13.9. | 2½. |
| Pea nuts | 29. | 61.7. | 1.8. | 6.5/7.5. | 2570. | 79.6. | .. |
| Peas | 0.18/1. | 16.5. | 0.5. | 83.2. | 250/350. | 12.4. | 2¼. |
| Peas, dried | 6.53. | 17.38. | .. | .. | 448. | .. | .. |
| | 25/28.8. | 61.8. | 2.6. | 16.8. | 1500/ 1655. | 86. | 3½. |
| Peas, green | 7/23.6. | 17.7. | 2 | 78.4. | 460/470. | | |
| Peas, fresh, green | 24.93. | .. | .. | 72.09. | 500. | .. | 3¼. |
| Pickles | 1.09. | 4.37. | .. | .. | 112. | .. | .. |
| Peppers, fresh green | 1.4. | 6.2. | .. | 91.5. | 155/450. | .. | 3¼. |
| Pigeon | 22.08. | 6.57. | .. | .. | 672. | .. | .. |
| Pine apple | 0.57/0.8. | 10.3. | 0.3. | 86.50. | 192/200. | .. | 2¼. |
| Plantains, green | 1.06/4.31. | 8.1. | .. | 83.24. | 176. | .. | .. |
| Plums | 0.68/5. | 9. | 2. | 89.9. | 250/270. | 10.8. | 2¾. |
| Pomogranates | 1.63/4.2. | 18.5. | 0.6. | 78.8. | 450/460 | .. | 3¼. |
| Pork | 9.8/18.66. | 48.9. | 2.3. | 77.41. | 848. | .. | 4¼/5¼. |
| Potato (boiled) | 2/6.62. | 20/23. | 1. | 74.73. | 400/770. | 24.4. | 2½/3½. |
| Potatoes, Irish | 2.0. | 19.1. | .. | 78.3. | 385/400. | .. | 2½. |
| „ Sweet | 1.8. | 27.9. | .7 | 76.8. | 400/565. | .. | 3¼. |
| Prunes, dried | 3.00. | 40.6. | .. | 90.3. | 160. | 8.5. | 3¼. |
| „ fresh | 2. | 62. | .. | 26/81.2. | 350. | 13.4. | 2¾. |

## APPENDIX IV

### Approximate Percentage, Composition and Calories etc., in Foods and Dietetic Articles, etc.

| Names of Articles | Average percentage of | | | Watery or refuse matters | Calories per lb. | Percentage of total nutriment | Hours required for digestion (Approximate) |
|---|---|---|---|---|---|---|---|
| | Proteins or flesh formers | Fats & Starch or Heat givers (Carbohydrates) | Mineral matters or salts (Ash constituents) | | | | |
| Pumpkin .. | 1.2. | 5/7.3. | .. | .. | 95. | .. | .. |
| Raddish (Muli) .. | 6.12. | 32.2. | 0.8. | 94.41. | 80/100. | .. | 3¼. |
| Ragi (Millet) or Bajri .. | 7/11.6. | 83.67. | 2. | 13/14. | 1635/ 1744. | .. | .. |
| Raisins | 3. | 75. | .. | 14/18. | 600/650. | .. | 2. |
| Rice, cleaned or washed | 6.43. | 93.77. | 1. | 12.66. | 1427/ 1808. | .. | .. |
| „ natural, brown .. | 6.75/10. | 80. | 1. | 10/12. | 1600/ 2750. | 87. | 1/2. |
| „ Parboiled .. | 6.5. | 93.93. | .. | .. | 1824. | .. | .. |
| „ polished .. | 6.75. | 92.65. | .5 | 7.7/ 12.4. | 1685/ 1808. | .. | .. |
| „ white (boiled) .. | 7.51. | .1. | .3. | 72. | 800. | .. | 1/2½. |
| Sago .. | 7.8. | 86. | 0.2. | 12/13. | 1800. | 85. | 2/3. |
| Semolina (Suji) .. | 14.84. | 52.21. | .. | .. | 1280. | .. | .. |
| Sandesh .. | 19.08. | 62.60. | .. | .. | 1984. | .. | .. |
| Skim milk & powder .. | 4.3/35.5. | 5.9. | 0.8. | 89. | 170/1830. | .. | .. |
| Soya Beans .. | 25/43.22. | 50.16. | .. | 8/11. | 750/2165. | .. | 3. |
| Soya flour .. | 42.0. | 44.0. | .. | 9. | 2165. | .. | .. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spinach .. | 1.92/3. | 4. | 2. | 88/92.76 | 100/110. | 10.5. | 3. |
| Squash .. | 1.5. | 8.8. | .. | 90.3. | 150/200. | 8.5 | 3. |
| Strawberries .. | 0.71/3.8. | 6.8. | 1.7. | 87.82. | .. | 10.1. | |
| Sugar brown (foreign) .. | 95.1. | .. | .. | .. | 1826. | .. | .. |
| „ brown (Indian) .. | 0. | 100. | 0. | 0. | 1800. | .. | .. |
| „ cane .. | 1.45. | .55. | 18.2. sugar. | 71.04 | 448. | .. | .. |
| „ white .. | | 100. Carbo-hydrates. | .. | .. | 1808. | .. | 1¼. |
| Tapioca .. | 0.68. | 0.3. | (87.73 C.H.) | .. | 1600. | .. | 2½. |
| Tomato, cooked .. | 1.5. | 3/4. | 0.5. | 94.3. | 96 to 100. | .. | 1¾. |
| „ raw .. | 1.88. | 7.1. | .. | 92.81. | do. | 6.8. | 2. |
| Tongue .. | 15.58. | 19.8. | .. | .. | 1072. | .. | .. |
| Turnips .. | .52/1. | 6.9. | .. | 94.10. | 200/238. | 5/12. | 3½. |
| Turnip tops .. | 1.1. | 7.1. | .. | 92.5. | 155. | .. | 3¼. |
| Varagu or Kodu millet | 8/12.6. | 71. | 2.4. | 12. | 208. | .. | .. |
| Veal .. | 20. | 7. | .. | .. | 700. | .. | .. |
| Vegetable marrow .. | 1. | 5.1. | .. | .. | 120/144. | .. | .. |
| „ Oils .. | 0. | 0. | 0. | 0. | 2000. | 0. | 3½. |
| Venison .. | 20. | 2. | .. | .. | 800. | .. | .. |
| Vetch (Kesari dal) .. | 28. | 56. | 3. | 13. | .. | .. | .. |
| Walnuts (frseh) .. | 13.6. | 41.8. | 1.7. | 44.5. | 3000 to | 88.2. | 3. |
| „ (dried) .. | 15.64. | 77.8. | 2. | 47.2. | 3370. | | .. |
| Water melons .. | 7.1. | 6.9. | 0.3. | 95.7. | 120/144. | .. | 2¾. |
| Wheat, whole grain .. | 11/15. | 72/75. | 2. | 12.5/ | 1571 to | 88. | 3¾. |
| | | | | 13.2. | 1750. | .. | .. |
| Whey—Cow's milk .. | .. | .. | .. | 93. | 150. | .. | 3. |
| Wine .. | .. | .. | .. | .. | 150. | .. | 1¼. |
| Yams .. | 1.80. | 22.47. | .. | .. | 448. | .. | |

**Informative Points:—**

(1) Total nutritive value or percentage of total nutriment in dried fruits is more than in fresh raw fruits. (2) An excess of cereal foods has a bad effect on the teeth.

Cocoanut oil; gingelly oil; linseed oil; groundnut oil; olive oil; cotton-seed oil; mustard oil; cocogem; etc., have almost the same percentage of fats and calories per lb. as the cod liver oil and fish liver oil.

**Cholesterol contents of food-stuffs:—**

| Animal Foods | | Vegetable Foods | |
|---|---|---|---|
| Egg .. | 1.85 %. | Onions .. | 0.05 %. |
| Yolk of egg .. | 2 %. | Carrots .. | 0.03 %. |
| Cheese .. | 0.8 %. | Bread .. | 0.025 %. |
| Bacon .. | 0.4 %. | Semolina (suji) | 0.02 %. |
| Pork .. | 0.24 %. | Potatoes .. | 0.015 %. |
| Butter .. | 0.1 %. | Chocolates .. | 0.07 %. |

N.B.—Animal food-stuffs contain much more cholesterol than do vegetable ones. E. & O. E.

The amount of food required by the average individual to enable him to do moderately hard work has been scientifically worked out in what are termed calories, each article of diet having a certain caloric value. These calories are obtained from the proteins, carbo-hydrates, fats, salts and water.

The term calorie (large*) means the amount of heat that is required to raise one pound of water 4° F., or raise the temperature of one kilogramme (2.2 pounds) of water 1° Centigrade; an amount of energy equal to that required for raising a weight much greater than our own bodies several feet off the ground. The Calorie is a standard which is as applicable in estimating the energy value of foods as the gramme or pound is in calculating weight.

* In measuring the heat value of foods the *large calorie*, which is 1,000 times greater than the one used in Physics, is used. The *gramme* is also used as the unit of weight for foods, one Gramme = 15 grains; 1 ounce = 28.35 grammes.

**Caloric Value of Food Constituents:—**

One (gr. or grm.) gramme of either pure protein or carbohydrate (sugar or starch) yields or furnishes respectively, on combustion 4.1 calories of heat; 1 gramme of fat yields on an average 9.3 calories; and 1 gramme of alcohol yields 7.0 calories of heat to the body.

The method of applying the Calorie standard to a food or any portion of diet, is very simple; in the case of protein and carbo-hydrates, the percentage contained in the food or diet is multiplied by 4.1 and in the case of fat by 9.3; the sum of these products is the total Calories yielded by 100 grammes of the food or diet. (1 lb. = 453.592 grms.) O'Meara.

"Scientists have proved by experiment that the foods we eat are oxidised in the body giving off carbon-di-oxide and water and releasing heat by which the warmth of the body is maintained and energy for work provided. Scientists have also been able to determine the amount of heat with which each feed will furnish the body and they indicate this quantity in term of *Calories*. In other words, the caloric value of any food is the measure of energy which is given out by the complete oxidation or burning up of substance in the body. A man doing moderately hard work requires food yielding from 2,500 to 3,500 Calories a day." (Scottish Manhood, Octr. 1926).

"The length of time" required for stomach digestion varies with different food substances; (vide this Table) and also depends upon the condition under which the food is eaten. Healthy stomach digestion requires at least 5 hours for its completion, and the stomach should have an hour for rest before another meal. If fresh food is taken before that which preceded it is digested, the portion of food remaining in the stomach is likely to undergo fermentation, thus rendering the whole mass of food unfit for the nutrition of the body, besides fostering various disturbances of digestion. It has been shown by recent observations that the length of time required for food to pass through the entire digestive process, to which it is subjected in the mouth, stomach and small intestines, is from 12 to 14 hours.—("Science in the Kitchen", by Mrs. E. E. Kellogg, A.M.,—Library of Health, Vol. V.)

"The most complete foods from the nutritional standpoint are the leafy vegetables,"—"Kidneys is better from the nutritional standpoint than Beefsteak"; "Whole wheat flour contains only about 95% of the whole wheat kernel, while

graham flour contains the whole kernel, and more of the minerals,—(Magnesium, Calcium, Potassium and the Phosphates)"—(New Pocket Quiz Book, (1945) by Slider and Crittenden).

The undermentioned Tables taken from an article by Drs. Samsum Blatherwick and Smith, in the Journal of the American Medical Association, (Vol. 81, No. 11, Page 883), give the principal foods, which are predominantly Acid and Alkali producing respectively:—

| Table 1. Acidity of certain foods. Per 100 Grammes. | | Table 2. Alkali producing Foods. Per 100 Grammes. | |
|---|---|---|---|
| Bread, white. .. | 2.7. | Almonds, .. | 12.38. |
| Bread, whole wheat | 3.0. | Apples, .. | 3.76.** |
| Corn, sweet, dried, | .95 | Asparagus, .. | .81. |
| Crackers, .. | 7.81. | Bananas, .. | 5.56.** |
| Cranberries, .. | *. | Beans, dried, .. | 23.87. |
| Eggs, .. | 11.10 | Beans, Lima, dried | 41.65. |
| Egg white, .. | 5.24. | Beets, .. | 10.86. |
| Egg yolk, .. | 26.69. | Cabbage, .. | 4.34. |
| Fish haddock, .. | 16.07. | Carrots, .. | 10.82. |
| Fish, pike, .. | 11.81. | Cauliflower, .. | 5.33. |
| Meat, beef lean, .. | 13.91. | Celery, .. | 7.78. |
| Meat, chicken, .. | 17.01. | Chestnuts, .. | 7.42. |
| Meat, frog, .. | 10.36. | Currants, dried. .. | 5.97. |
| Meat, pork lean, .. | 11.87. | Lemons, .. | 5.45. |
| Meat, rabbit, .. | 14.80. | Lettuce, .. | 7.37. |
| Meat, veal, .. | 13.52. | Milk Cow's, .. | 2.37. |
| Oysters, .. | 30.00. | Muskmelon, .. | 7.47.** |
| Oat meal, .. | 12.93. | Oranges, .. | 5.61.** |
| Pea nuts, .. | 3.9. | Peaches, .. | 5.04. |
| Prunes, plums, .. | * | Peas, dried, .. | 7.07. |
| Rice, .. | 8.1. | Potatoes, .. | 7.19.** |
| Additional Acid-producing | | Radishes, .. | 2.87. |
| foods:— | | Raisins, .. | 23.68. |
| (1) Bacon. | | Turnips, .. | 2.68. |
| (2) Fish; Salmon; Sardines. | | Additional Alkali-producing | |

| Table 1. Acidity of certain foods. Per 100 Grammes. | Table 2. Alkali producing Foods. Per 100 Grammes. |
|---|---|
| (3) Mutton. | foods:— |
| (4) Walnuts. | (1) Beans, string. |
| | (2) Cocoanuts. |
| | (3) Cucumbers. |
| | (4) Molasses. |
| | (5) Mushrooms. |
| | (6) Onions. |
| | (7) Pears. |
| | (8) Peas, green. |
| | E. & O.E. |

It will be observed from these that in the main, eggs, fish, meats and oysters are the greatest acid-producing foods which enter into the dietary, most commonly used.

* The ash of these foods is alkaline, but because of contained substances which form hippuric acid in the body, they increase the acidity of the urine.

** These foods have been found experimentally to be very efficient in reducing the acidity of the body.

(From "Obesity: Its Types and Treatment", booklet published by Battle and Co.'s Chemists' Corporation, St. Louis, Me.)

## APPENDIX V

### Vitamins in Foods And Dietetic Articles

Vitamin constitutes an unknown substance or a small vital element, "Accessory Food Factor", or "a constant constituent of living tissues"—also a body builder, discovered by Funk, existing in several of our important dietetics in very minute quantities, and found from careful investigation and experiments to be the most essential one for normal development of the young and maintenance of health, in addition to the five well-known elements, viz., proteins, carbo-hydrates, fats, salts and water.

"The number of vitamins thought to exist is increasing. Some, but not all of the newly discovered ones, have been shown to be necessary to human beings. The chemical com-

position of vitamins, A, $B_1$, C, $D_2$, $D_3$, E, K, riboflavin, nicotinic acid, pyridoxine and pantothenic acid is known, and some of them have been synthesised. On the other hand, "Vitamin" $B_5$, and Factor "Y" are now thought to be identical with pyridoxine. Fresh evidence of the existence of the "Case in Factor" has come from America".—(For more exhaustive details, re. Vitamins, read Chapters on Vitamins in "The Extra Pharmacopoeia" (1943), by Martindale, and "Treatise on Tropical Therapeutics", (1950), by Sir R. N. Chopra, etc.)

Surgeon-General Cumming of the United States Public Health Service, says:—"Let me emphasize this fact: We should obtain our vitamins from our food supplies and not from drug stores or from nostrum vendors; we need select only the proper foods to eat, and we will get an abundant supply of these precious substances".—("Drugless Road to Perfect Health", by Joseph H. Greer, M.D.).

Vitamins exist in most of the natural foods, both animal and vegetable, particularly in glandular organs and products, (e.g. milk, eggs, and liver, and in green grasses, vegetables and fruits, and in the Embrayo and Hilla of Cereals and Yeast). Vitamins are produced more in plants, from which they pass directly with vegetable foods and indirectly with animal foods into the human system"; and it is from such sources that milk—human or animal—obtains the high percentage of vitamins that is so valuable to infants and young animals.

It is found that food free from vitamins is apt to cause diseases, generally known as deficiency diseases,—such as scurvy beri-beri, rickets, eye-diseases like Xerophthalmia or Kerato-malacia, pellagra, osteomalacia, etc. and absence of vitamins may even cause death. It is even said that without vitamins, we slowly perish, physically and mentally. Vitamins themselves do not contribute to the energy supply of the body, but facilitate utilization by it of proteins, fats, carbo-hydrates, and salts of food and vice-versa, i.e., they are complementary to each other.

"The best and only certain source of all the vitamins is a well balanced diet; therefore, a person in health with proper nutrition does not require vitamin supplements. Yet many persons, even in good economic circumstances, eat less vitamin containing foods than are necessary for optimal health. No controlled evidence exists to show that vitamins exert a "tonic" effect. There is probably much indiscriminate use of the vitamin supplements. In illness there may be considerable variation in the body requirements depending upon age,

activity, diet, metabolic rate, and other factors affecting the absorption, utilization and excretion of the vitamins. Vitamin deficiencies are usually multiple, particularly of fat soluble or B complex vitamins as a group. Early signs of vitamin deficiency are usually non-specific, vague, mild, easily misinterpreted or missed entirely. The crude sources of the vitamins are often more efficacious in therapy than the pure or synthetic. Only during the more severe phases of the deficiencies is it usually necessary to resort to the use of "pure" vitamins. Treatment of vitamin deficiencies requires an adequate, balanced, high protein, high vitamin diet, in addition to necessary vitamin supplements. In general, it is wise to use vitamins therapeutically in 5-10 times the amount required for daily maintenance."—"Handbook of Medical Management.", (1951).

"Vitamins", says Dr. Hector Munro, a Harley Street Specialist, "are nothing more nor less than stored sun-light. The rays of light most valuable to health are those to the right of the spectrum, and when these rays are excluded from an area in which a plant has been placed, the plant dies. These rays are caught and held by the fruits of the earth and are the vitamins of which so much has been heard, lately. Oranges and lemons contain a higher percentage of stored sun-light than any other fruits in the world."

"As regards the question of the vitamins in general, I am of opinion that their importance is being over-estimated by the public at the present time, or perhaps it would be better to say, that the importance of making special provision for them is over-estimated. If the diet is right in other respects, and especially, if it contains a reasonable amount of milk, animal fat, and green vegetables, then the Vitamins may be left to look after themselves. Should you, however, fear that the diet may be deficient in the most important of the Vitamins —the fat-soluble—I should advise you to supply them in a natural form, such as fish-oil, rather than as one of the many artificial preparations with which the market is now flooded." (Dr. Robert Hutchison in "British Medical Journal", 10-3-1934).

Isolation of a number of Vitamins in crystalline form, recognition of various clinical pictures due to deficiency of these vitamins, and standardisation of dosage in treating these conditions, constitute an important advance in medicine during the past decade. *The subject of vitamin deficiency, however, has resulted in widespread exploitation of the public and claims that are obviously extravagant are*

*constantly being made.* The recognition and treatment of early deficiency-states present many difficulties. Cayer has recently brought the material together in a compact form. He found that single deficiencies rarely occurred in men. For this reason, the clinical picture may be exceedingly complex. *It is unwise to make a diagnosis on the basis of symptoms alone.* In patients who have an actual deficiency, satisfactory response to oral therapy may be anticipated within 1 to 3 weeks. The physician should be familiar with the particular product that he is prescribing and should compare the dosage listed on the label with the therapeutic requirements given in the following Table that was prepared by the Food and Nutrition Board of the National Research Council:—

*Daily Dietary Allowance of Vitamins for Adults*

| | For men weight 150 lbs. | For women weight 120 lbs. | Minimum. | Therapeutic Dose. |
|---|---|---|---|---|
| Vit. A. International Units. | 5000. | 5000. | 4000. | 25,000. |
| Thiamin, mg. | 1.8. | 1.5. | 1. | 10 to 20. |
| Riboflavin, mg. | 2.7. | 2.2 | 2. | 5 to 15. |
| Niacin, mg. | 18. | 15. | 10. | 100 to 150. |
| Ascorbic acid, mg. | 75. | 70. | 30. | 100 to 300. |
| Vitamin D. Int. Units. | 400. | .. | .. | .. |

("Pharmacology & Therapeutics", (1948) by Dr. M. A. Kamath)

"Diets, deficient in one vitamin, are often deficient in others. Test administration of one of the B. Group of Vitamins gives more accurate information for diagnosis purposes than giving of foodstuffs rich in all members of this group. If deficiency of one member of this group is demonstrated, it may be assumed that deficiency of the others either exist or is near at hand, and the proper treatment would be to provide all the Vitamins in abundance. Not all the Vitamins are equally important to ordinary man, who is chiefly concerned with A.B.C. and D." All vitamins appear to function as enzymes or co-enzymes in important metabollic processes.

"Vitamins are non-amino acid organic compounds supplying active groups in hormones, respiratory enzymes and other substances controlling the activities of the body", that must be supplied to the organism from exogenous sources. "If

a person with depleted body reserves of one of the water-soluble Vitamins is given daily a dose representing several times the daily requirements of that Vitamin, most of it will be retained in the body until the body reserves have been built up, after which, the greater part of each dose will be excreted in the urine. Thus, by testing the urine daily until there is a sudden marked increase in its content of the particular Vitamin, we can find how much of the Vitamin had to be given to saturate the body reserves, and thus obtain a measure of the degree of deficiency. Such urine saturation tests have been widely employed in nutritional surveys to discover whether the diet has been supplying the deficiency of a given vitamin."—(Pharmaceutical Pocket Book, 1944, Page, 296).

"The body needs a wide variety of substances for repairs; some of these it can manufacture, but others it has to obtain ready-made. The latter fall into two groups, viz., those which are stable, and those which are easily destroyed. Metallic salts like those of iron are stable ones. The unstable group of substances are present in fresh food, vegetables or fruits, but are easily destroyed by processes used in food preservation, *and these are Vitamins.* Both of these groups enter into the composition of blood through the food stuffs, that animals eat. But as Vitamins are produced only in plants, they pass directly with vegetable food, but indirectly with animal foods, into the human system. It has been observed that a total deprivation of these Vitamins in the case of rapidly growing animals, (human beings also) lead to diseases, now known as 'deficiency diseases',—the most common being, Scurvy, Beri-beri, Rickets and Pellagra. Recent investigations have led to the discovery of minimum human needs of the various Vitamins. It is important to remember that the *minimum* requirement is not the same as the optimum supply. The aim of nutrition is not to discover the deficient diets on which human beings can manage to survive, *but the diets optimum* for the maintenance of full health and activity. The effects provided by complete Vitamin-lack are much easier to recognise than are the effects of partial deficiency; and these latter are more important in the investigation of disease.

Vitamin deficiency may arise from three causes: (1) Deficiency of Vitamins in food; (2) *Failure to absorb Vitamins from food;* (e.g.—Chronic gastritis may prevent the absorption of water soluble Vitamins; obstrusive jaundice prevents the absorption of Vitamin K., leading to a tendency of bleeding which is noticed in Cirrhosis of the liver). (3) Conditions in which Vitamin needs are increased.

Though people are becoming more and more "Vitamin-Conscious" these days, it is advisable that they try to obtain them from a mixed diet rather than from synthetic products and Government will confer a boon on the people if it should see that rationing is skilfully devised to ensure the distribution of Vitamins.

N.B.—For details of sources of varied Vitamins, refer to the Table at the end of this Appendix.

Vitamins have been classified as either Fat-soluble or Water-soluble:—

| Fat-soluble Vitamins. | Water-soluble Vitamins. |
|---|---|
| A:—Axerophthol. | B or $B_1$ (F) or Thiamin. |
| $D_1$, $D_2$, $D_4$, etc., from sterols. | $B_2$ Complex. |
| E. | $B_2$ (G) or Riboflavin; Panthothenic acid. |
| K. | $B_6$ (H) or Adermin; Pyridoxine.<br>$B_7$ Nicotinic acid or Acidum Nicotinicum or Niacin.<br>$C_1$ or Ascorbic acid.<br>Para-Amino-Benzoic Acid; Folic Acid; Biotin; Inositol; Choline; or Hesperidin. |

**Table for Vitamin Measurements:—**

1 Microgram = one millionth of a gram, or
1 Milligram = 320 International Units.

N.B.—Progressive research (scientific and medical) has been fast changing the old conceptions about Vitamins.

Vitamins are called fat-soluble, because they are found in fats or oils of animals or plant tissue. They exist in that small portion of the fats which is not saponifiable, i.e., they are not themselves fat.

Vitamins A. C. and D. and Calcium and Phosphorus most directly influence tooth structure. Vitamins A. C. and D. are all necessary for the proper building of the mineral salts into the living tissues of the body. The Vitamins that a pregnant woman needs are vitamins A. B. C. and D.

The sooner the vegetables are cooked and eaten after they are brought from the garden or market, the better. It must be noted that prolonged cooking, canning or drying destroys the Vitamins (except Vitamin "D"), even though all the rest of the nutrition of the foods remains. Moderate cooking does not kill all of them, though it weakens their action. Vegetables are best cooked with a little moisture and fat. A large number of common ailments can be cured by improved methods of cooking and dieting, and a higher standard of public health and general fitness can be secured. But, remember that the maximum amount of good is obtained from vitamins present in food in the raw state. That is why Salads should always be preferred to cooked foods.

Col. MacCarrison, the great Food and Nutrition Expert has summarised the functions of Vitamins thus:—

1. Vitamins are constant constituents of living tissues. Although present in very small amounts, maintenance of health is dependent on their action.

2. Vitamins themselves do not contribute to the energy supply of the body, but facilitate utilisation by it of proteins, fats, carbo-hydrates and salts of food.

3. Proteins, fats and carbo-hydrates and salts cannot support life without Vitamins, nor Vitamins without these proximate principles; they are complementary to each other; without Vitamins, the body starves.

4. A distinct relationship exists between the amounts of Vitamins required and the balance of food in protein, fats, carbo-hydrates and salts, the efficiency of Vitamin depending on the composition of the food mixture.

5. A distinct relation exists between the amount of Vitamin required and the rate of metabolic processes.

6. Each Vitamin plays a specific part of nutrition.

7. It appears that Vitamin A. is associated with the metabolism of lipoids and calcium, as well as the chemical re-actions requisite for growth and maintenance.

8. Vitamin B. appears to be associated with the metabolism of carbo-hydrates and with the chemical re-actions and functional perfection of all cells, particularly nerve-cells.

9. Vitamin C. appears to be associated with the metabolism of Calcium and with the chemical re-action of growing tissues.

10. All Vitamins are concerned in the maintenance of

orderly balance between destructive and constructive cellular processes.

11. One Vitamin cannot replace another, although its function may be interfered with by the absence of another.

12. The final result of their deficiency is the same whatever be the degree of deprivation; the greater the deprivation, the more rapid is the onset of symptoms due to it; the lesser the deprivation, the slower is the onset of the symptoms due to it.

13. Each Vitamin exercises a specific influence on the adrenal glands; the effect of their deprivation on these organs is one of the most outstanding features of deficiency diseases.

14. Vitamins influence markedly the production of hormones and all external secretions.

15. There is reason to believe that the capacity of any given cell for work is impaired in proportion to the degree of Vitamin starvation.

16. Vitamins aid the tissues in resisting infection.

17. Vitamins, especially Vitamin B. induce in the human and animal body a desire for food.

18. Vitamins are one link in the chain of essential substances requisite for harmonious regulation of chemical processes of healthy cellular action. If the link be broken, harmony ceases or becomes discord, as it may cease or become discord, if any other link be broken.

19. The place of Vitamins in human economy must be considered in connection with the metabolism as a whole, in connection with their relation to other essential food requisites, with their relation to organs of digestion and assimilation and with their relation to endocrine regulators on metabolic processes.

The Vitamins have special influences on the adrenal glands. According to Dr. George W. Orile, "The adrenal gland is to the autonomic system, approximately what brain is to the cerebro-spinal system. It forces the kinetic drive. There are 35 nerves going through the adrenal." ("Health and Happiness", November, 1935, Pages 268 and 269).

## VITAMIN REQUIREMENTS OF MAN

The following are the authoritative, summarised minimum amounts considered necessary by the League of Nations' Health Organisation and the optimal amounts suggested by

the National Nutrition Conference for Defence, U.S.A. (1941):—

| For a man of 70 Kilos. | Vit A. I.U. | Vit. B. I.U. (Thiamin). | Vit. C. Mg. (Ascorbic acid). | Vit. D. I.U. Mg. | Riboflavin ($B_2$) Mg. | Nicotinic acid. Mg. |
|---|---|---|---|---|---|---|
| Minimum requirements. | 3000. | 300. | 30. | .. | .. | .. |
| Optimal requirements. | 5000. | 700. / 600. / 500. * | 75. | .. | 3.3. / 2.7. / 2.2. * | 23. / 18. / 15. * |

*According to heavy, medium or light work.

## VITAMIN REQUIREMENTS

The Food and Nutrition Board of the National Research Council (England), has recommended the following daily allowances for the three best known members of the Vitamin B Complex.

| | | Thiamine. ($B_1$). Mg. | Riboflavin. ($B_2$). Mg. | Nicotinic Acid. Mg. |
|---|---|---|---|---|
| Man (70 Kg.) | | | | |
| Moderatively active, | .. | 1.8. | 2.7. | 18. |
| Very active, | .. | 2.3. | 3.3. | 23. |
| Sedentary, | .. | 1.5. | 2.2. | 15. |
| Woman (56 Kg.) | | | | |
| Moderatively active, | .. | 1.5. | 2.2. | 15. |
| Very active, | .. | 1.8. | 2.7. | 18. |
| Sedentary, | .. | 1.2. | 1.8. | 12. |
| Pregnancy ( Latter half,) | .. | 1.8. | 2.5. | 18. |
| Lactation, | .. | 2.3. | 3.0. | 23. |
| Children up to 12 years. | | | | |
| Under 1 year, | .. | 0.4. | 0.6. | 4. |
| 1 — 3 years, | .. | 0.6. | 0.9. | 6. |
| 4 — 6 years, | .. | 0.8. | 1.2. | 8. |
| 7 — 9 years , | .. | 1.0. | 1.5. | 10. |
| 10 —12 years, | .. | 1.2. | 1.8. | 12. |

| | | | |
|---|---|---|---|
| Children over 12 years (Girls). | | | |
| 13 —15 years, .. | 1.4. | 2.0. | 14. |
| 16 —20 years, .. | 1.2. | 1.8. | 12. |
| Boys. | | | |
| 13 —15 years, .. | 1.6. | 2.4. | 16. |
| 16 —20 years, .. | 2.0. | 3.0. | 20. |

1 Mg. thiamine equals 333 International Units.

Daily allowances of other Vitamins as recommended by the National Research Council in 1948:—

| | | | |
|---|---|---|---|
| Vitamin A. | 5,000—8,000 I.U. | P-P Niacin | 10—20 mg. |
| $B_1$ Thiamin | 1.2—1.8 mg. | C. Ascorbic acid | 70—150 mg. |
| $B_2$ Riboflavin | 1.8—3.0 mg. | D. | 400 units. |

There is no evidence of harmful effects from overdosage of any of the Vitamins except perhaps Vitamin D. and then only when the diet contains excessive amounts of Calcium. Even then the ill-effects can be counteracted by taking large amounts of salads and green vegetables.

The best way to ensure adequate intake of Vitamins (both known and unknown) is to eat "Whole" foods or foods which have been processed as little as possible. If a food is "refined" in some way, a valuable part of it may be removed, and this part will almost certainly contain not only known substances, but unknown substances, some of which may be essential for perfect nutrition. Vitamin concentrates should only be resorted to, when serious deficiency is suspected, for even the best of them can only make up certain deficiencies, not all.

It should be realised that different samples vary greatly in their Vitamin content. Moreover, in assessing the Vitamin content of a diet, it should be remembered, (a) that Vitamin A. is affected very little by cooking, but that Vitamins $B_1$ and C. may be partly dissolved out in the cooking water, (about one-quarter), and partly destroyed by heat (about 1 quarter); hence the Vitamin $B_1$. and C. contents of foods may be reduced to one half size by ordinary processes of cooking; and (b) it is not certain that man can make full use of the carotene in vegetables and therefore the Vitamin A. value of a vegetable to man is probably only about a half or one-third of that indicated by a chemical determination of its carotene content", (pages 767—768 of Martindale's Extra Pharmacopoeia, Vol. II, 1943).

Prof. V.H. Mottram, the great European authority on Nutrition, who has done very valuable work on Vitamins concludes:—

> On one occasion, he cooked butter for sixteen hours at a temperature above the boiling point of butter. At the end he found the Vitamin A. content was just as high as before. He found that Vitamin D. can stand distillation at comparatively high temperatures, and that Vitamin $B_1$. can also withstand boiling. His great conclusions have been that reasonable cooking destroys none of the Vitamins except C., which is destroyed by prolonged heat. Potatoes lose their Vitamin C. if cooked for 20 minutes, and then put in a hay box for six hours!"

The effect of canning on Vitamin contents has been shown to be much less drastic than supposed. Canning or cooking fruits may destroy up to 50% of their Vitamin content, in some cases much less. But an ordinary helping of canned grape fruit still contains enough to provide a day's ration of Vitamin C.

Great progress has been made in the production of synthetic Vitamins and Vitamin Extracts, extremely valuable for "fortifying" foods and for treatment of cases of Vitamin deficiency. The isolation of Vitamin A. from liver oil should result in less waste and greater use being made of, for instance, fish livers.

Vitamin C. has been shown to be an important factor in the healing of wounds and setting of bones. During the war, there were many opportunities of discovering the effects and deciding on the best ways to use the Vitamin for this purpose. Every British soldier was provided with a box of 100 synthetic Vitamin C. tablets, which ensured freedom from deficiency of this Vitamin, when active service conditions enforced a diet that might be lacking in fresh vegetables and other natural sources. Many chemical plants in Britain are engaged on the large scale manufacture of the synthetic Vitamin, which appears to be the same in every way, as the natural product.

It is important to distinguish between Vitamin "Extracts" and synthetic Vitamins. Extracts are made from natural products, rich in the Vitamin, the essential chemical being concentrated. The synthetic Vitamin is made by following an analysis of the structure of the chemical and it may be built up from the atoms in raw materials far removed from the natural foods, which are rich in the Vitamin. The great advantage is the enormous quantities that can be made,

quantities far greater than could be economically produced from natural sources. Synthetic Vitamins will be particularly important in restoring health to liberated territories of the World War II.

Man does not live by Vitamins alone, but it has been shown that these mysterious chemicals play a vital part in enabling him to make proper use of foods essential to health. Ordinary man taking a varied diet is likely to get all the Vitamins he needs without giving the matter a thought and this, of course, is the ideal method.

There is still much to be discovered in this comparatively new branch of dietetics. It is a fascinating study and is remarkable for the minute quantities which can make all the difference between good health and serious illness. (From "Six Scientific Years"—(1946), by Prof. A.M. Low).

N.B.—For still more detailed information re. Vitamins, readers are requested to read authoritative publications (Books as well as Journals) on Western Materia Medica, Pharmacology, and Therapeutics, and also the following publications, though small, will be very useful:—

1. Booklet titled "Vitamin Products for Prescription Use" published every year by Messrs Eli Lilly & Co., Manufacturing Chemists, Indianapolis 6, Indiana (U.S.A.)

2. "V.D.H. Vitamin Products", booklet published by British Drug Houses, Ltd., London.

3. "Vitapan:—New Combination of Vitamins",—booklet published by Cipla, Bombay 8.

## APPENDIX V.

## VITAMINS &C., IN FRUITS AND DIETETIC ARTICLES

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine contents per kilogramme. |
|---|---|---|---|---|---|---|---|---|
| Alfalfa grass (dried). | | | | | 2. | | | |
| Almonds, .. | 1. | 2. | L. | | | | | Contains iodine. |
| Amaranth leaves, | 3. | .. | 3. | | | | | |
| Apples, (fresh) | 1. | 1. | 3V. | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine contents |
|---|---|---|---|---|---|---|---|---|
| Apricots, .. | 3. | 1. | 1. | | | | | |
| Artichoke, .. | 1. | 1. | 1. | | | | | 0.31. |
| Asparagus, (white, green), | 1. | 3. | 3. | | | | | |
| "Atta" see:—wheat flour, whole | | | | | | | | |
| Bananas (raw) (green) .. | 2. | 3. | 2. | | | | | |
| Barley, pearled, | | 1. | | | | | | |
| Barley, whole grain. .. | 1. | 2. | N. | | 1. | | | Contains iodine. |
| Beans cooked, (string), .. | 2. | 2. | 1. | | | | | |
| Beans dried, .. | | 1. | | | | | | |
| Beans French, .. | 1. | 2. | 2. | | | | | 0.32. |
| Beans green, snap, | 3. | 3. | 3. | | | | | |
| Beans kidney, (dried) .. | L. | 3. | 1. | | 1. | | 1. | |
| Beans Lima, .. | 1. | 2. | 1. | | | | | |
| Beans Navy, .. | 1. | 3. | N. | | | | | |
| Beans Soy, or Soya, .. | 3. | 3. | 2. | 2. | | | | |
| Beans Soy, see:—Soy beans .. | | 1. | | | 1. | | | |
| Beans String (fresh), .. | 2. | 2. | 2. | | | | | |
| Beans Sprouted, | 1. | 2. | 2. | | | | | |
| Beef, lean, .. | 1. | 1. | 1. | 1. | | | | |
| Beef, fat, (suet), | 3. | N. | N. | 3. | | | | |
| Beet leaves, (greens), .. | 2. | 2. | | | | | 1. | |

* 1.—Contains the Vitamin. 2.—Good source of the Vitamin. 3.—Excellent source of the Vitamin. N.—No appreciable amount of the Vitamin. D.—Doubt as to presence or relative amount. L.—Evidence lacking or insufficient. V.—Variable.

N.B.—If you desire to see a Table of Vitamins according to the basis of International Units, and Micrograms, Milligrammes, etc., please refer to the Annual Diaries published by the Teddington Chemical Factory, Ltd., P.O. Box 229, G.P.O., Bombay, 1.

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine contents |
|---|---|---|---|---|---|---|---|---|
| Beets, (Beetroot), | N. | 2. | 3. | | | | 2. | |
| Beets, stems, .. | | 1. | | | | | | |
| Beets, tops, .. | 1. | 1. | 1. | | 1. | | 3. | |
| Blackberries, .. | .. | 1. | 2. | | | | | |
| Brains (Animal), | 1. | 2. | 1D. | | | | | |
| Bran of rice (fresh) .. | | 2. | | | 1. | | | |
| Bread, brown, .. | 2. | 2. | | | | | | |
| Bread, white (water), .. | D. | 1. | N. | | | | | |
| Bread, white (milk), .. | 1. | 1. | D. | | | | | |
| Bread, whole, meal, | 3. | 3. | | | | | | |
| Bread, whole wheat (water), .. | 1. | 2. | D. | | | | | |
| Bread, whole wheat (milk), .. | 2. | 2. | D. | | | | | |
| Brinjal, .. | | 2. | 1. | | | | | |
| Brussels sprouts, | 3. | 1. | 3. | | | | | |
| Butter, .. | 3. | 1. | N. | 2. | 1. | | | |
| Butter, fats, .. | | | | 3. | | | | |
| Butter-milk, or Sour milk, .. | 1. | 2. | 1V. | 1. | | | | |
| Cabbage, cooked, (head), .. | 1. | 2. | 1. | | | | | |
| Cabbage, fresh Raw, white & green, | 3 | 3. | 3. | | 1. | | 2. | 0.21. |
| Carrots, cooked, | 2. | 1. | 1. | | | | | |
| Carrots, fresh, raw, | 3. | 3. | 3. | 3. | 3. | | 3. | |
| Cauliflower, .. | 1. | 2. | 3. | | | | 2. | |
| Celery & celery root, .. | 1. | 3. | 2. | 1. | 2. | | | |
| Celery bleached & stems, .. | 1. | 2. | 4. | | | | | |
| Celery bleached leaves, .. | 3. | 2. | L. | | | | | |
| Celery green leaves, | 2. | 2. | L. | | | | | |
| Cereals, whole grain (unmilled), .. | 3. | 3 ($B_1$). | | 1. | 2. | | | |
| Chappati, .. | 2. | 2. | L. | | | | | |
| Cheese, full milk, (fresh), .. | 3. | 1. | L. | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | Iodine 'G' Contains |
|---|---|---|---|---|---|---|---|
| Cheese, cottage, | 1. | L. | L. | | | | |
| Chestnut, .. | L. | 1. | L. | | | | |
| Chillies, green, | 1. | | 2. | | 2. | | |
| Chicken, .. | 1. | 1. | 0. | | 1. | | |
| Chocolate, .. | | 1. | 1. | | | | |
| Citrus fruits, .. | | | 3. | | | | |
| Cocoa, .. | | 1. | | | | | Contains iodine. |
| Cocoanut, dried & fresh, resptly. | 1. | 2. | L. | | | | |
| Cocoanut, milk, | 1. | 1. | | | | | |
| Cocoanut, oil, .. | | | | 1. | | | |
| Codliver oil, .. | 3. | | | 3. | 1. | | Contains iodine. |
| Coffee, | Has vitamins in a small amount. | | | | | | |
| Coriander & its leaves, .. | 3. | | 3. | | | | |
| Corn, cobs, .. | .. | 2. | .. | | | | |
| Corn, dried, .. | 1. | 1. | 1. | | | | |
| Corn, meal, .. | 1. | 1. | 1. | | | | |
| Corn, sweet, .. | 1. | 1. | 1. | | | | |
| Corn yellow, .. | 3. | 2. | 1. | | | | |
| Corn, maize, (white), .. | 1. | 2. | L. | | | | |
| Corn, maize, (yellow), .. | 1. | 2. | L. | | | | |
| Crab, | | | | | | | 1.82. |
| Cream, .. | 3. | 2. | 1V. | 1. | | | |
| Cresso, .. | L. | L. | 1. | 1. | | | |
| Cucumber, .. | 1. | 1. | 2. | | | | |
| Curds,—See Dadhi. | | | | | | | |
| Currants, black, | .. | .. | 3. | | | | |
| Dadhi, (dahi), i.e., Curds, .. | 1. | 1. | 2. | | | | |
| Dandelion, Greens, | 3. | 2. | 2. | | | | |
| Dates, (Persian), | 3. | 1. | 1. | | | | |
| Dhal, .. | 1. | 3. | 3. | | | | |
| Drumstick, .. | .. | .. | 3. | | | | |
| Duck, .. | 1. | 1. | | | | | |
| Egg plant, dried, | 1. | 2. | 1. | | | | |
| Eggs, .. | 3. | 2 ($B_1$) | 1. | 3. | 1. | | Contains iodine. |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine Contents |
|---|---|---|---|---|---|---|---|---|
| Eggs, yolk, .. | 3. | 2. | 1D. | 3. | 2. | | | |
| Endive (Escarole), | 3. | 2. | 2. | | | | | |
| Fats, animal, .. | 3. | | | 2. | | | | |
| Figs, dried & fresh respectively, | | 1. | 1. | | | | | |
| Fish, fat, .. | 3. | 1. | L. | | | | | |
| Fish, fresh, e.g., Hilsa, .. | 3. | 2. | | 2. | | | | |
| Fish, Lean, .. | N. | 1. | L. | 3. | | | | |
| Fish, Liver oils, | | | | 3. | | | | |
| Fish, Oils, .. | 2. | | | | | | | |
| Fish, Roe & fish liver & oils, .. | 2. | 2. | 1D. | 3. | | | | |
| Flour, white, .. | L. | 1. | L. | | | | | |
| Flour, whole wheat, | N to 1. | 2. | | 1. | 1. | | | |
| Fresh vegetables, green & leafy, .. | 3. | | 3. | | | | | |
| Fruits, fresh & juices, .. | 3. | 2. | 2. | | | | | |
| Garlic, .. | 1. | 1. | 2. | | | | | |
| Germ of rice, .. | 1. | 2. | | 1. | 2. | | | |
| Gourd, bitter, .. | | | 3. | | | | | |
| Grams, .. | 1. | 2. | | 1. | | | | iodine. |
| Grams, germinating, | 3. | 2. | 3. | | | | | Contains |
| Gram, Bengal, | 3. | | 3. | | | | | 0.020. |
| Ghee pure or butter (clarified), .. | 2. | | | 2. | | | | |
| Grape fruit, .. | 1. | 2. | 3. | | | | | |
| Grape juice, fresh, | 1. | 1. | 3. | | | | | |
| Grape juice & grapes, .. | | 1. | 1. | | | | | Contains iodine. |
| Greens, .. | 3. | | | | | | | |
| Green leaves, .. | 3. | 2. | 2. | | 3. | | | |
| Groundnut, .. | .. | 2. | .. | | | | | |
| Guava, .. | .. | 1. | 3. | | | | | |
| Gurh or Indian brown sugar, | .. | 1. | | | | | | |
| Halibut, .. | .. | | | | 1. | | | |
| Halibut, liver oil, | 3. | | | 3. | | | | |
| Heart (Animal) | 1. | 2. | | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine. Contents |
|---|---|---|---|---|---|---|---|---|
| Herrings, .. | 3. | | | | | | | |
| Hickory nuts, .. | L. | 2. | L. | | | | | |
| Honey, .. | | 1. | | | 1. | | | |
| Horse radish, .. | 1. | 1. | 1. | | | | | |
| Husks of certain seeds, .. | 3. | | | | | | | |
| Jack fruit, .. | 3. | | | | | | | |
| Kidney, (animal) | 2. | 3. | 1D. | | | | | |
| Kohlrabi, .. | 1. | 1. | 3. | | | | | |
| Ladies' fingers, | | 2. | 1. | | | | | |
| Leafy vegetables, | 3. | 3. | | | | | | |
| Leeks, .. | 1. | 1. | 2. | | | | | |
| Legumes, sprouted, | L. | 2. | 2. | | | | | |
| Lemon juice, fresh, | 2. | 2. | 3. | | | | 2. | Contains Iodine |
| Lentils, dried, .. | 3. | 3. | | | | | | |
| Lettuce leaves, fresh | 3. | 3. | 3. | | 3. | | 2. | -do- |
| Lichee, .. | .. | 1. | 2. | | | | | |
| Limes, .. | L. | 1. | 1. | | | | | |
| Linseed, .. | 2. | 2. | | | | | | |
| Liver (animal's) & liver extract, | 3. | 3 ($B_1$) | 2. | 3. | 3. | | | |
| Liver-oils, .. | 3. | | | | | | | |
| Lobster, | | | | | | | | 1.78. |
| Mackerel, .. | 1. | | | | | | | |
| Maize, (yellow) & maize oil, .. | 2. | 3. | | | 3. | | | Contains iodine. |
| Mango, ripe, .. | 3. | 1. | 3. | | | | | |
| Marmite (yeast extract) .. | | 2. | | | | | | |
| Meat, goats', .. | | 1. | 1. | | | | | |
| Meat, lean, | N to 1. | 2. | 1D. | | 2. | | | |
| Meat, underdone, | 2. | | | | 2. | | | |
| Milk (Sheep's), Buffalo's, .. | 3. | 1. | 1. | 1. | | | | |
| Milk, condensed, | 3. | 2. | 1. | | | | | |
| Milk, Cow's, .. | 3. | 3. | 3. | 3. | | | | |
| Milk, dried (whole) | 3. | 2. | 1V. | | | | | |
| Milk, fresh, raw/ unboiled, .. | 3. | 3. | 2. | 2. | 2. | | | -do- |
| Milk, goats' & sheeps', .. | 3. | 1. | 1. | 3. | 1. | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine Contains |
|---|---|---|---|---|---|---|---|---|
| Milk, 'scalded', .. | 3. | 2. | 1. | | | | | |
| Milk, skimmed, (cow's dried), | 1. | 2. | 1V. | 1. | 1. | | | |
| Milk, whole, raw, (dried), .. | 2. | 1. | 1. | | | | | |
| Millet, (Ragi), | 3. | 2. | | | | | | |
| Molasses, .. | 2. | 1. | | | | | | |
| Mother's milk, (human), .. | 3. | 1. | 1. | | | | | |
| Mushroom, .. | 1. | 2. | | | | | | |
| Muskmelons, .. | 1. | 1. | 2. | | | | | |
| Mutton Fat, .. | 2. | 1. | N. | | | | | |
| Mutton, lean, .. | N. | 1. | N. | 1. | | | | |
| Nolkole, .. | 1. | 1. | 1. | | | | | |
| Nuts, (Ground), | | 2. | | | | | | |
| Oatmeal, .. | 1. | 2. | | | 1. | | | 0.009. |
| Oats, rolled, whole | 1. | 3. | N. | | 2. | | | Contains iodine. |
| Oleomargarine, | 1. | N. | N. | | | | | |
| Olive oil, .. | 1. | | | 1. | 1. | | | |
| Olives, ripe & dried, respectively, | | | | | 1. | | | |
| Onions, raw, | N. to 1. | 3. | 2. | | | | | |
| Onions, cooked, | 1. | 2. | 1. | | | | | |
| Orange juice, fresh, | 3. | 2. | 3. | 1. | 1. | | 2. | |
| Orange peel, .. | 1. | 1. | 2. | | | | | |
| Oysters, (raw), | 2. | | | 1. | | | | Contains iodine. |
| Palm oil, .. | 1. | 1. | 1. | | | | | |
| Papaya ripe, .. | 3. | 1. | 3. | | | | | |
| Parsley, .. | 3. | 2. | 3. | | | | | 0.017. |
| Parsnips, .. | ND. | 2. | 2. | | | | | |
| Peaches, fresh (raw), .. | 1. | 1. | 2. | | | | | |
| Peanut or Arachis oil, .. | 2. | 2. | L. | 1. | | | | Contains iodine. |
| Peanuts, (raw), | 3. | 2. | L. | | | | | |
| Pears, .. | | 1. | 1. | | | | | |
| Peas, dried, .. | 1. | 2. | L. | | 1. | | | |
| Peas, green, fresh & sprouted, .. | 3. | 2. | 3. | | | | | 0.80. |
| Peppers, fresh, | | | | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine Contents |
|---|---|---|---|---|---|---|---|---|
| green, .. | 3. | 2. | 3. | | | | | |
| Pigeon, .. | 1. | 1. | | | | | | |
| Pig, kidney, fat, | 2. | N. | N. | | | | | |
| Pineapple (fresh, raw), juice, etc., .. | 2. | 2. | 3. | | | | | |
| Pine nuts, .. | 1. | 1. | L. | | | | | |
| Plums, .. | | 1. | 1. | | | | | |
| Polishings of rice: see rice polishings below. | | | | | | | | |
| Pomegranates, | | 1. | 1. | | | | | |
| Pomels, .. | | | 3. | | | | | |
| Porridge, .. | | 2. | | | | | | |
| Potatoes (boiled 10 min.), .. | 1. | 2. | 2. | | | | | |
| Potatoes (white, raw), | N to 1. | 2. | 2. | | | | | 0.010. |
| Potatoes, fresh, | 1. | 1. | 1. | | | | | |
| Potatoes, (boiled 1 hour,) .. | L. | 2. | 1D. | | | | | |
| Potatoes, Sweet, | 3. | 2. | 1. | | | | | |
| Potatoes, white, baked, .. | 1. | 2. | 1. | | | | | |
| Prunes, fresh & dried, respectively, | 3. | 3. | N.D. | | | | | Contains iodine. |
| Pumpkins, .. | 3. | 1. | 1. | | | | | |
| Radishes, .. | L. | 2. | 3. | | | | | |
| Raisins, .. | L. | 1. | 1. | | | | | |
| Raspberries, (fresh or canned) .. | L. | L. | 3. | | | | | |
| Rice-bran (See Bran of rice). | | | | | | | | |
| Rice-germ (See germ of rice). | | | | | | | | |
| Rice-natural, brown & red, whole, | 3. | 2. | | | 2. | | | -do- |
| Rice-polishings, (See polishings of rice above). | | | | | | | | |
| Rice (unmilled or unpolished), | N to 1. | 3. | D.1. | | 3. | | | 0.17. |
| Rice (whole grain), | 3. | 2. | | | | | | |
| Roots, fleshy, .. | | 1. | 1. | | | | | |
| Root vegetables, | | 3. | | | | | | |
| Rutabaga, | N.D. | 2. | 3.D. | | | | | |
| Rye, whole, .. | 1. | 3. | L. | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine Contents |
|---|---|---|---|---|---|---|---|---|
| Sago, .. | | 1. | | | | | | Contains iodine. |
| Salads, .. | | | 3. | | 3. | | | |
| Seeds, (germinating), (for sprouts), | | | 3. | | 3. | | | |
| Shrimps, .. | 2. | | | | | | | |
| Shrimps, Grey, | | | | | | | | 5.91. |
| Skim milk powder | | 3. | | | | | | |
| Soji or semolina, | 1. | 3. | | | | | | |
| Sorrel, | | | | | | | | 0.12. |
| Sour-milk, See Butter-milk. | | | | | | | | |
| Spinach, cooked, | | | 2. | | | | | |
| Spinach, dried, | 3. | 2. | L. | | | | | |
| Spinach, fresh, (raw), .. | 3. | 3. | 3. | 3. | 3. | | 2. | |
| Sugar, white, .. | | 1. | | | | | | |
| Squash, (Hubbard, yellow), .. | 3. | 1. | 1. | | | | | |
| Sugarcane, .. | | 1. | 1. | | | | | |
| Sweet breads, | 1. | 1. | L. | | | | | |
| Sweet potatoes, | 3. | 2. | 2. | | | | | |
| Tamarind, dried), | | 1. | 1. | | | | | |
| Tapioca, .. | | 1. | | | | | | |
| Tea leaves, Contains vitamins in moderation. | | | | | | | 1. | 0.23. |
| Tomatoes, (raw or canned), .. | 3. | 3. | 3. | | | | | |
| Tomatoes, (cooked), | 2. | 3. | 3. | | | | | |
| Turnips, green, (tops), .. | 3. | 3. | 3. | | | | 2. | |
| Turnips, tops, .. | 3. | 3. | 2. | | 1. | | | |
| Turnips (yellow), | 1. | | 2. | | | | | |
| Turnips, (cooked) | | | 2. | | | | | |
| Veal, .. | L. | 1. | L. | | | | | |
| Vegetables, green, cooked, .. | | | 2. | | | | | |
| Vegetables, green & raw, fresh & leafy, | 3. | 2. | 3. | | 2. | | | |
| Vegetables, yellow, | 3. | | | | | | | |
| Vegetables, oils, | N to 1. | | | 1. | 3. | | | |
| Walnuts, .. | L. | 3. | L. | | | | | Contains Iodine |
| Water-cress, .. | 3. | 2. | 3. | | | | | |

| Articles. | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' | 'G' | Iodine Contents |
|---|---|---|---|---|---|---|---|---|
| Water-melons, | 1. | 1. | 1. | | | | | |
| Wheat bran, & embryo, .. | 1. | 2. | L. | | | | | |
| Wheat flour, whole (Atta), .. | 1. | 3. | | | 3. | | | 0.007. |
| Wheat germs (germinated wheat) & their oil, | 2 | 3. | | | 3. | | | Contains Iodine |
| Wheat, whole grain, | | 2. | | 1. | 3. | | | |
| Whey, cow's milk, | 1. | 1. | 1. | | | | | |
| Wine, .. | | | 1. | | | | | |
| Yams, .. | | 1. | 1. | | | | | |
| Yeast & yeast extracts, .. | | 3. | | | | | | |
| Yellow corn, .. | 3. | | | | 3. | | | |
| Yolk of eggs, .. | 3. | 2 | | 2. | | | | |

Iodine containing Foods & Dietetics articles, other than those listed in this Table.

(1) Green corn.

(2) Green lentils.

(3) Chestnuts.

Addendum to above Table of Vitamins, etc.

| Vitamin A. | B. & $B_1$. | $B_2$ | C. | D. | E. | G. | P. |
|---|---|---|---|---|---|---|---|
| Asparagus. (unbleached) | Animal organs. | Animal organs. | Animal blood. | Clams. | Whole grains. | Broccoli. | Lemon juice. |
| Avocados. | Cambu. | Certain green leafy vegetables. | Black currants. | Grains. | | Collards. | |
| Bamboo sprouts. | Cantaloupe. | | Collards. | Oils. | Fresh meat. | Kale. | |
| | | | | Sea-plants. | | | |
| Broccoli. | Cereals un-milled. | Citron juice. | Edible, fresh fruits, (particularly Citrus). | Sunshine or Sun-light. | Oils of cereal germs. | | |
| Cambu. | Cholam. | | | | | | |
| Chard. | | | | | | | |
| Cholam. | Collards. | Common pulses | | | | | |
| | Kale. | Egg yolk. | | | | | |
| Collards. | | | Grains & Dhalls sprouted. | Ultra violet rays. | | | |
| | Malt extract. | Gram — Bengal; Black & Red. | | | | | |
| Drumstick leaves. | Muscle meat. | | Lemon-peel. | Vegetables grown in Sun-light. | | | |
| Kale. | | | Rhubarb. | | | | |
| Mustard greens. | Mustard greens. | | | | | | |

| | | | |
|---|---|---|---|
| Oil of pigmented vegetables | Nuts of all kinds. | Lean meat. | Rosehips. |
| | | Liver. | |
| Okra. | | Malted Barley. | Strawberries. |
| | Okra. | | |
| Pickles. | | Milk-products. (including skim-milk: butter-milk, curds, cheese, whey). | Tangerines. |
| | Pickles. | | |
| Ragi or Bajri. | Pork. | | |
| Red Palm Oil. | Pulses. | | |
| | Ragi or Bajri. | | |
| Sprouted grains. | | Muscle meat. | |
| Tampala. | Rice par-boiled even milled. | Nuts of all kinds. | |
| Vegetable Tops. | Strawberries. | Roots and Tubers. | |
| Viscera of Fishes. | Tampala. | | |
| Yellow root Vegetables. | Tongue. | Yeast. | |

N.B.—The following do not contain *any* Vitamins:—(1) Doubly or tribly heated ghee; (2) Par-boiled Rice; (3) Rice white; (4) Starch; (5) White of an Egg; (6) Adulterated ghee.

As these are times of Food Shortage in India, and cries of "Eat More Fruit", "Drink More Milk," and "Eat More Fish" are rampant, hereunder is given a 'Fish Food Value Chart', for the attention of non-vegetarians to enable them choose the best:—

**FISH FOOD VALUE CHART**

| Commodities. | Vitamins. | Protein. | Fat. | Mineral Nutrients. |
|---|---|---|---|---|
| 1. Carp, .. | A.B. | 19% | 1% | Calcium, Phosphorus, Copper, Sulphur, Iodine. |
| 2. Cat fish, .. | A.B. | 14% | 21% | -do- |
| 3. Crabs, .. | A.B.G. | 17% | 2% | -do- |
| 4. Herrings (Indian) .. | A.B.D. | 19% | 11% | -do- -do- |
| 5. Jew fish, .. | .. | 18.76% | 0.21% | -do- |
| 6. Lobsters, .. | A.B. | 16% | 2% | -do- |
| 7. Mackerel, | A.B. | 19% | 7% | -do- |
| 8. Mussel (Blue), .. | .. | 9.92% | 1.97% | |
| 9. Oysters, .. | A.B.D.G. | 6% | 1% | C.I.C.P.S. |
| 10. Pomfret, .. | .. | 20.30% | 2.60% | .. |
| 11. Prawns, .. | .. | 20.76% | 0.69% | .. |
| 12. Ribbon fish, | .. | 18.11% | 3.24% | .. |
| 13. Salmon, .. | A.B.D.G. | 22% | 13% | .. |
| 14. Sardine, .. | .. | 20.84% | 1.93% | .. |
| 15. Shark, .. | .. | 22.93% | 0.69% | .. |
| 16. Shrimps, .. | A.B.D. | 25% | 1% | .. |
| 17. Seer, .. | .. | 22.45% | 4.06% | .. |
| 18. Trout, .. | A.B. | 18% | 10% | .. |

(Hind Fisherman, Octr. 10th, 1951, Vol. 1, No. 1, Madras.)

**Vitamin A:**—This is anti-infective, and Fat-soluble, existing in great proportions in Cod-liver Oil and Shark-liver Oil,—is a stable non-nitrogenous substance which promotes growth and prevents rickets in children and young animals. Vitamin A. in the diet of infants, newly-born and growing, strengthens and preserves the epithelial membranes, thereby increasing their resistance to infective organisms, and when sufficiently supplied to the pregnant mother, prevents only in-

fection from developing in the mother. Therefore, this Vitamin is absolutely essential to the pregnant mother and the growing child. Adults, however, need only a small quantity. "Persons who are on normal dietary are not benefitted by Vitamin A, even if it is administered in large doses". (Dr. H. V. Savnur). "It has got special action on the skin and mucous membranes, which line the inside of the eyelids, the nose, the air passages, the stomach, the bowels and the bladder; i.e., it is essential for maintaining the integrity of the epithelial linings throughout the body and the proper structure and function of the nervous system. "The healthy skin or mucous membrane offers resistance to the entry of deceased germs into the body."

The main sources of the active parts of this Vitamin are:—Certain fats of animals,—except lard and vegetable fats—and to a lesser extent from red fruits and vegetables. Cereals and nuts are, in general, poor in Vitamin A. "While vegetable *foods* do not contain Vitamin A. the yellow pigment (of plants) *carotene,* which is not easily affected by heat, but is said to be destroyed by ultra-violet light; (whose character is pro-Vitamin A., or the precursor or mother-substance of Vitamin A."), which is present in many such foods, especially in the yellow of fruits,—in the Carrot from which the name of the pigment is derived,—and in the vegetables, appears able to fulfil the physiological functions of Vitamin A. in the body.

"Vitamin A. is formed in the liver of the animal body from the carotenoid plant pigments and crypto-xanthin, which occur in green vegetables and cereals; but animals concentrate this Vitamin in their fatty-tissues, Kupffer cells, in increasing amounts, with increasing age upto adulthood. Chlorophyll in green vegetables is an indirect source of Vitamin A. There are four types of carotene, viz., *a, B and y,* and Crypto-xanthin, of which *a and B.* carotenes are the most important. The carotenes are hydro-carbons, belonging to the class of terpenes."

In Cod-liver Oil Vitamins A. and D. are so proportioned that no further supplementing of Vitamin D. is needed. In the case of Shark-liver Oil, Vitamin A. is very predominant, so that further supplementing of Vitamin D. will be needed to render it more balanced. Fortunately concentrated Vitamin D. preparations like Calciferol are easily available to do the needful satisfactorily. Vitamin A. requirements can be covered by the consumption of a suitable well-balanced vegetable diet. Vitamin A. and D. tablets, prepared scientifically in Haffkine Institute, Parel, Bombay, are recommendable.

In western countries, a large proportion of the total Vita-

min A. activity of the diet is usually derived from Vitamin A. contained in animal foods, which are comparatively expensive, and there, pure Vitamin A. has been synthetically prepared as a crystalline substance, from the fish-liver oil, notably of the Shark and Halibut, the properties of which are identical to the properties of natural Vitamin A. It is called Axerophthol. Vitamin A. crystals are regarded as having 3 million International Units per 100 grams. While one millionth gram of pure carotene is regarded as the International Unit of Vitamin A. The International Unit (I.U.), is the "Reference Cod-liver Oil" of the U.S.P., which contains 3000 I.U. per Gm. The International Standard Unit is one U, (0.001 mgm). "Some Nutritionists regard that the daily intake of Vitamin should be 4000 International Units, while for optimal dose, 50% more should be provided for healthy adults". "Over-dosing with Vitamin A. or supply more of it at a time than can be utilised or stored in a system, causes no toxic effects. The unassimilated portion is simply excreted out. When oral administration of Vitamin A. is not possible, it may be introduced parenterally or subcutaneously". "Larger doses may be given without undesirable effects and are often advisable in the early treatment of deficiencies. When relief of deficiency symptoms has been obtained, considerably smaller doses may be continued for long periods". But, if Vitamin A intake is massive (e.g., 500,000—1,000,000 I.U. daily), it may cause alopecia, itching, bone pain from new growth of periosteal bone."

> "Before World War II, we (Indians) depended for supply of Vitamins A & D. on Cod-liver Oil imported mainly from Norway and later on from England. Cod-liver Oil was known from a very long time for its growth-promoting and ricket-preventing properties. During the early stages of Vitamin research, Cod-liver Oil was thought to be a very rich source of Vitamin A. & D. As there was no other method but the costly and time-consuming biological method of testing and assaying Vitamins A. and D., other sources of these Vitamins were slow to be found. But easier and quicker chemical and physico-chemical methods were soon developed for determining Vitamin A., and soon richer sources of Vitamin A. were discovered. Cod-liver Oil on an average contains about 1000 International Units of Vitamin A. per gram; never exceed 3000 generally. Halibut Liver Oil, on an average, 50,000 International Units per gram and sometimes tops 300,000 Units. Indian Shark-liver Oil averages about 10,000 to 15,000 and at times reaches

200,000 Units. To-day, therefore, Cod Liver Oil is considered, comparatively, a poor source of Vitamins A. and D."

(U. Sunder Kini, B.Sc. (Hons),—In Souvenir of the V South Indian Provincial Medical Conference, October 13th to 15th, 1950, pages 31, Mangalore).

Carotene ($C._{40}$ $H._{56}$) is found in animals, in all green leaves, Carrots, Tomatoes, and many Red Fruits, and in plants. Carotene in crystalline form, when fed to animals, is converted to Vitamin A. The conversion of Carotene into Vitamin A. may be made in vitro by adding Liver-Extract. It is assumed, therefore, that liver tissue contains an enzyme, carotenase, which causes this distranformation. When oxygen is excluded, Vitamin A. is heat-stable, but it can readily be destroyed at room temperatures when exposed to air So far as fruits and vegetables are concerned, there is no serious injury to the Vitamin content from cooking or canning. But in the animal foods high temperature in the presence of O. or oxidising agents destroy it. "Carotene is useless to the body unless converted to Vitamin A.; its estimation in the blood is, therefore, of little clinical value. "Vitamin A. is readily stored up in the animal body and the contents of various tissues and of milk, depends to a considerable extent on the richness of food in this factor. This storage is only for some time. This Vitamin cannot be found directly in the animal body. It is produced primarily in the plant".—"Health and Happiness", Novr. 1935, Calcutta.

**Daily requirements of Vitamin A:**—Though our knowledge of Vitamin A. requirements is at present, limited, a well-balanced human diet should contain a daily minimum of 3,200 to 5,000 International Units (1.8 mg.) or 4,000 to 8,000 units, which equal 1-2 milligrams of the pure substance, or about twice that weight of carotene (or 3 mg. of B.—carotene) for adults; 6,000 to 8,000 International Units for children and 5,000 to 6000 for pregnant women, and during lactation 8,000 I.U. "The Vitamin A. requirements of children appear to be as high as those of adults, and since young children eat much less food than adults, this food should be richer in Vitamin A. or carotene". Therapeutic dose is about ten times the above.

"For cure of keratomalacia or night-blindness, taking of fresh milk, or Cod Liver Oil or fish-liver oil, or a large slice of animal liver—raw or cooked—has been found useful". Clinical and experimental evidence indicates that Vitamin A. is essential for normal function of the retina, and its use is helpful in myopia, retinal and choroidal diseases". (Dr. R. S. Agarwal's "Mind and Vision". 1944—3rd Edition.)

"Vitamin A. is synthetised by many sea-fishes, which live on algae and their livers contain very rich stores of Vitamin A". "Pan or betel leaves (which are green) chewed after meals, ensures the intake of Vitamin A. In the East, the easiest and cheapest way of ensuring a sufficiency of Vitamin A. units is to increase the intake of green vegetables — the greener the better, and the fresher the better, — which contain greater proportion of Carotene." "Vitamin A. deficiency is common in India, and care must be taken to ensure that diets supply a sufficiency of this Vitamin". Diet, rich in Vitamins, especially Vitamin A. should be given in all stages of pulmonary tuberculosis; because, the deficiency of Vitamin A. retards growth and lowers resistance to bacterial infection".—(Dr. Priyo Gopal Mukerjee, L.M.F., Saranga P. O., (Burdwan Dt.)—Bengal), in "Medical Digest", March, 1937, page 47, Annual Special T. B. Number.

**Vitamin $A_2$:**—has been isolated from the liver and other organs of fresh water fishes. This is not identical with Vitamin A., but is believed to have the same function of Vitamin A. and occasionally in contra-distinction Vitamin A., is written as Vitamin $A_1$.

Fats and oils of vegetable origin derived from oil-seeds etc., are in general devoid of carotene and Vitamin A. But, Red Palm Oil, which is obtained from the fruit of the Palm, Elasis guineens is grown in West Africa, Malaya and Burma, is very rich in Vitamin A.

Vitamin A. occurs in pale yellow needle-like crystals melting at 5.5 to 6 degrees C. to an almost colorless viscous oil, (also an unsaturated alcohol); volatile in super-heated steam, or in a very high vacuum. It is stable in oil and fat solvents and also fairly soluble in water. It is less stable than Vitamin D., being destroyed by oxidation, when heated at ordinary pressure. *By passing oxygen through heated Cod Liver Oil, Vitamin A. is completely destroyed.* In butter, this Vitamin is confined to the portion of the fat with low melting point and is not destroyed by steam. Vitamin A. has been concentrated into a fraction of the unsaponifiable lipoides of Cod Liver Oil. It is believed that it is a labile oxidation product of oxycholesterol."

The two substances, carotene and Vitamin A., generally but not necessarily, occur in the same food-stuffs. Carotene can be easily obtained, and purified and has now been accepted as an International Standard for comparison of the Vitamin A. content of foods.

Animals can obtain Vitamin A. from its precursors, or "provitamines', the carotenes, (Q. V.). Carotene produces complete protection in animals on a Vitamin A. deficient diet.

**Stability of Vitamin A:**—Vitamin A. survives the high temperature of distillation of concentrates, 137° under 0.00001 mm. pressure, and *it is not destroyed by ordinary cooking processes,* e.g., Milk does not lose this Vitamin by boiling or pasteurising, but when evaporated by vacuum or aeration method, it is destroyed, i.e., it is destroyed by drying or prolonged heating or cooking *in contact with air or oxygen,* e.g., prolonged heating of ghee in an open pan at the frying temperature of 200°C. may cause destruction of Vitamin A. The purest concentrates are also highly resistant to aerial exidation at high temperatures. Both canned and frozen foods retain their Vitamin A. content for long periods, but rancid fats have a catalytic effect on their decomposition. "Further evidence has been obtained that the ordinary process of boiling vegetables does not decrease their Vitamin A. content. (Annual Report for 1941, of Research Departments of College of Pharmaceutical Society. London and Cardiff).

**Chemical Characters:**—Vitamin A. is stable to heat, but readily destroyed by acids, oxidizing agents (when impure) or ultraviolet light. It can be got without Vitamin D. from concentrates of mammalian liver oil, and when pure, it is a pale yellow viscous oil.

There are three methods,—biological, physical, and colorimetric or chemical—available for the estimation of Vitamin A. potency of fish liver oil. The last two offer advantages of speed and reproductability, while the biological method is fundamentally more accurate and reliable".—(U. Sunder Kini, B.Sc., (Hons.) in Souvenir of the Vth South Indian Provincial Medical Conference, October 13th to 15th, 1950, (Page, 33), Mangalore.

**Standard of Vitamin A:**—The International Unit is the specific activity contained in O. 6 microgram (1 millionth of a gram) of the standard preparation of pure B. Carotene. Pure Vitamin A. has an activity of 3,00,000 units per gramme.

**Shortage of Vitamin A. causes:**—Retardation or cessation of growth and development, or wasting; reduced resistance to diseases, (bacterial infections) especially, throat, lung. or gland infections, bowel disorders, (atrophy of the cells of the salivary glands, the mucous glands of the intestinal villi), ear and eye diseases (two types of change of vision; xerosis or xerophthalmia and keratomalacia exhibited by virulent con-

junctivitis with corneal thickening and ulceration; cessation of regeneration of the visual purple and so production of night-blindness in children), hyper-keratosis of the skin, i.e., "Toad-skin", or dryness of the skin, and liability to popular eruptions; drying up of glands and mucous membranes; failure in the development of bone and teeth; certain forms of diseases of the spinal cord from degeneration of myelin sheath; anaemia; susceptibility to cold, catarrh, influenza, respiratory diseases; and even pneumonia, (degenerative changes of keratinisation of the epithelium in the mucous membrane, of the nose, trachea and bronchi), tuberculosis, imperfect development of the periodontal tissues, kidney and bladder affection, paralysis of various types from demyelination of the spinal cord; decrease in number of blood-platelets; proliferation of cancellous at the expense of compact tissue; development of phosphatic calculi. Animals deprived of Vitamin A. become more susceptible to bacterial infections owing to the degenerative changes in the epithelial protective membranes of the body.

**Vitamin A. contents of certain foods:**—Milk 1 pint, Butter, 1 Oz., Carrots, (fresh or boiled) ½ lb. Cabbage, (fresh or boiled) ¼ lb.=2000 units; one egg of 20 grams.=600 units; Cod Liver Oil, per dram=200 to 13,000 units; Halibut Liver Oil, per drop (20 mg.)=600 to 1200 units.

**VITAMIN B**—is anti-neutrotic and anti Beri-beri or water-soluble, *but not soluble in fat,* is Nature's natural tonic health Vitamin, that nourishes the nerves and muscles; that creates sound appetite; that off-sets constipation and its resultant ills; prevents occurrence of Beri-beri in human beings, and analogous polyneuritis etc., diseases in animals; in short, this Vitamin is necessary for the maintenance of life and health at all ages. Vitamin D., which is isolated as its chloride-hydrochloride, is essential for the proper metabolism of carbo-hydrate (of especial importance to brain and nerve-tissue), its pyrophosphate ester forming the co-enzyme of the carbo-oxylase. "Vitamin B. is not destroyed by the ordinary process of cooking though soluble in wâter. Therefore, the fluids from the cooked rice or vegetables should not be thrown off, for, then the Vitamin B. will go with them." In other words, if rice is subjected to several washings before consumption, a great proportion of Vitamin $B_1$ it contains may be lost and there will also be a loss of mineral matter. Vitamin B. is not a simple one; it has been split up and synthetised. It consists of several factors,—all of which are present in yeast extract,—which have been designated as $B._1$, $B_2$, $B._3$ $B._4$, $B._5$, $B._6$, $B._7$, and $B._{12}$. It is found to some extent in all natural food-stuffs,

especially in the seeds of plants, beans, nuts, fruits, etc., also in cereals and grains, not too thoroughly milled or fine. *The finer the flour, the less are the Vitamins.* Cereals are good sources of B. Vitamins, which are concentrated in the embryo. Milk, cheese, and potatoes yield less anti-neutritic Vitamins; and it is noteworthy that milk, which is a good source of most of the important food factors, is not rich in Vitamin $B._1$; all whole grain foods are rich in Vitamin $B._1$, while milled grains are largely deprived of this Vitamin. *An exception is parboiled milled rice, which retains Vitamin, $B_1$, after milling.* While yeast retains large quantities of Vitamin, which will rapidly cure experimental polyneuritis. This Vitamin is also washed away from vegetables cooked in an excess of water. Internal organs of animals fed on green foods, *but not of fowls,* contain Vitamins B. & C.

Vitamins B. and $B._1$ factors are richly available in the germs and outer layers of whole grain cereals and legumens, beans, yeast and pea-nuts, but are also present in green vegetables, fruits (tomatoes, etc.), egg-yolk, liver, meat and milk, (especially, lean pork, liver and kidney). *They are absent in white bread but present in wholemeal bread. No natural tissue is a rich source.*

Vitamin B. complex group is water soluble, contains a large variety of different substances, especially of two factors, one thermolabile and the other thermostable—all of which are present in yeast extracts, rice polishings and liver. It contains a number of distinct principles—the important ones being $B_1$, $B_2$ and $B_2$ complex, which comprises Riboflavin, or Lactoflavin; Nicotonic Acid, or Niacin, or Amide of Nicotinic Acid; Pyridoxine ($B_6$); Adermin; Vitamin H., or Biotin; Choline Adenylic Acid, (a complex of adenin, ribose, and Phosphoric Acid); Pantothenic Acid; Pamino-benzoic Acid; Inocitol and Folic Acid. This group is a respiratory mediator concerned with oxidation-reduction mechanism in body cells.

**Vitamin $B_1$., or Aneurin or Thiamin Hydrochloride of U.S.P. or Hydrochloride of B.P.**—It was held at one time that the water-soluble Vitamin B. possesses both Anti-neuritic, or Anti-neurotic and growth-promoting properties. But it soon became evident that yeast behaved peculiarly under the influence of heat. When heated under pressure, yeast was found to lose its Anti-neurotic properties, although it retained its growth-promoting properties. Steaming or exposure to moist heat reduces the thiamin content of foods. From 1928 this came to be definitely recognised and the Anti-neurotic substance began to be called Vitamin B. or $B_1$, and the growth-

promoting, heat-resisting, water-soluble substance began to be called Vitamin $B_2$, or G. Vitamin, B. or $B_1$, later on came to be known as Thiamin (Thiamine-Chloride), and amongst pharmacists and pharmacologists, Vitamin B. or $B_1$, is more current as Thiamin. Small quantities of the crystalline substance representing Thiamin were obtained from very large quantities of rice-polishings. This crystalline substance allowed of further examination and ultimately in 1936, a substance could be built artificially in the laboratory step by step, which was identical in every respect with the natural product. This is Thiamin. So, $B_1$, is also manufactured synthetically.

"**Aneurine Hydrochloride:** contains in 1 gram 320,000 units of Vitamin $B_1$, which is obtainable in tablets and in sterile acqueous solution in ampoules. The hypodermic route should be used for administration in cases where the deficiency is due to defective absorption as in pyloric stenosus or chronic diarrhoeas. Where there is loss of appetite and defective tone of the gastro-intestinal tract, the parenteral route is also advisable. In other cases, it can be given by the oral route. No evidence has been brought forward to show that over-dosage produces any ill-effects".

"Though wheat-germ has been recommended as the richest natural source of Vitamin $B_1$, recent research has shown that this Vitamin is much more concentrated in the scutellum".

**Vitamin $B_1$., or Thiamin deficiency causes.**—Peripheral neuritis; intestinal stasis; wasting (loss of tone) of the bowels; retention of the putrid food residue and absorption of products of putrefaction and auto-intoxication. Minor degree of deficiency in children causes retardation of growth, poor appetite, constipation, neuritic pains and tenderness in the muscles; Beri-beri characterised by anorexia, loss of flesh and strength, poly-neuritis, oedema and bradycardia, neuritis of pregnancy and the same ailments, which are due to want of Vitamin B.

*Thiamine*—is said to benefit various types of neuritis, such as those caused by alcohol, lead and arsenic. It promotes peristalsis and maintains the normal nutrition of the gut; Neurasthenia, neuralgia, peptic and varicose ulcers, atonic constipation, pyelitis, vomitting of pregnancy, lack of appetite, chronic fatigue, eczema and cardiac weakness.

Yeast is a good source of Thiamin, next best to sprouted '*Mung*', (*green-gram*) a familiar article of food in India. The hydrochloride of Thiamin is taken as the standard and 3 micrograms are taken as corresponding to 1 International Unit.

In deficiency of Thiamin, a daily dose of 1 tablet, contain-

ing 3 milligrams of 960 units, which is regarded as the normal requirement of a man is administered, *when the requisite quantity cannot be easily obtained from available food sources.* Otherwise the daily requirement of adults is 300 to 500 units. In pregnancy and childhood, it is greater. Still it varies greatly with different people, and in the same person at different times; is greater when carbo-hydrates in the diet are increased, and in alcoholics. As the body does not store this Vitamin, but is rapidly excreted in the urine; so it should be given daily. Therapeutic dose is 3 to 20 times the above.

**Chemistry of Vitamin $B_1$.:**—Vitamin $B_1$., is isolated and synthesised as a white crystalline powder and its chloride, hydrochloride, and may be extracted from sources, in which it occurs naturally, such as rice polishings, and yeast, or it may be obtained synthetically. Crystalline compounds with hydrochloric, Nitric and Sulphuric Acids have been prepared. "It is the thiazol derivative of 2-mythyl-6 amino-pyrimidine and is a sulphur containing Vitamin. It is colourless, freely soluble in water and may be obtained in a pure state by extraction from natural sources or by synthesis. In dry condition it is stable at 100°C. Destruction in cooking is not great unless Sodium-bicarbonate is added to vegetable, but pressure cooking causes rapid destruction".

**Character of Vitamin, $B_1$.:**—It is amino-peptide hydrochloride containing Cl. N. and S, and is a white crystalline powder. It is readily soluble in water. Its odour and taste are bran-like. It should be protected from light during storage. It withstands boiling in acid medium, is more stable than Vitamin C., but less so than other Vitamins. It is easily destroyed by Oxygen in alkaline solution. "It is readily absorbed from the intestine and readily excreted by the kidneys with limited storage in muscles, liver, kidney, heart and brain."

"**Thiamine Chloride**—(Aneurin-Vitamin $B_1$) is essential for the normal intermediate metabolism of carbo-hydrate; i.e., it regulates the use of carbo-hydrate in the body. In its absence the splitting of carbo-hydrates stops with the formation of *Pyruvic Acid,* a substance having a toxic effect on nerve tissue. This would explain the frequent occurrence of multiple neuritis in alcoholic, who aside from their common dietary deficiency obtain a large part of their caloric intake in the form of carbo-hydrates or alcohol. Moreover, carbo-hydrate consumption creates the need for more than the average quota of Thiamine. It has been shown that the multiple neuritis of alcoholics is relieved by adequate amounts of Thiamine Chloride without abstinence from alcohol. Carol & Johnson have

shown that the toxic amblyopia of alcoholics behaves in every respect like multiple neuritis yielding to adequate amounts of Thiamine Chloride even when the previous consumption of alcohol is continued. Restoration of normal vision was rapid in early cases, while in later cases it occurred more slowly and was often incomplete. After saturating the patients with Thiamine by oral doses or by intra-muscular injection fairly large doses were continued for long periods. Since it seemed possible that often fractions of the Vitamin B. (Complex), might be of value in protection or restoration of damaged nervous tissue they advocated the use of Vitamin B. (Complex), in addition to crystalline Thiamine Chloride. Vitamin $B_1$ is to be found *inter alia* in whole cereals, pulses, nuts and yeast.

The very definite results in toxic amblyopia have stimulated the use of Thiamine Chloride in other forms of optic neuritis of both the typical and retro balbar forms. This treatment is given in addition to any other treatment indicated by the supposed cause of the disease. While the evidence in these forms of optic neuritis is by no means so conclusive, as in cases of toxic amblyopia, due to the tendency of optic neuritis to improve spontaneously, there seems to be no contra-indication to employing Thiamine Chloride in all cases, since a deficiency may be a factor in certain cases and an extra supply of the Vitamin may be of value in restoration of nerve tissue when damaged by various agents. There is even some evidence that the lesions of multiple sclerosis recover more quickly with less likelihood of recurrence when large doses of Thiamine Chloride are provided."

"In the conditions mentioned above, 20 to 50 milligrams (6,000 to 15,000 I.U.) is advised to be given daily by intramuscular or intra-venous injection during the first week, when the dose may be cut to 10 Mg. a day by injection, or considerably larger doses by the mouth as absorption by this route is incomplete. Oral dosage should be continued for long periods in amounts of 10 to 15 Mg. per day".

("Pharmacology & Therapeutics), (1948) by Dr. M. A. Kamath).

"The daily average requirements for an adult is about 1.2-1.8 Mgm.; infants require about ¼ of this amount, and the requirements in pregnancy and lactation are 5 times the normal adult average. In pregnancy large amounts of Aneurine are required and it is believed that the poly-neuritis of pregnancy is a result of aneurine deficiency. Increased physical work, pregnancy and hyper-thyroidism necessitates in-

creased intake, as the utilisation of anuerine is directly related to that of carbo-hydrates."

**Standard and Dose:**—"The International Unit is defined as the anti-neuritic activity or potency of 10 Mg. of the absorbate of Vitamin $B_1$, or of 3 grams of pure $B_1$, i.e., 300 I.U., equals 1 Mgm; or pure crystalline Vitamin $B_1$ has an activity of 500 I.U. per Mg. The minimum daily requirements for an adult of 17 kilo weight (11 stones) on 3000 calories a day is approximately 300 I.U., or 1 Mgm., but 500 to 700 I.U. is desirable. Infants need 50-60 I.U. (0.2 Gm.)".

Vitamin $B_1$ may be administered by the mouth in the form of solution or tablets, or may be administered by subcutaneous, intra-muscular or intra-venous injection. Parenteral Therapy is suitable to cases where gastric secretion of hydrochloric acid is effective.

**Doses:**—Prophylactic, daily 100 to 200 units; Imperial 1/200 to 1/100 grains; or 2 to 10 Mg. (1 Mg. is equal to 500 Units.) In deficiency state 2 to 4 Mgm. are usually required to secure rapid improvement. However, in doubtful cases, large doses, 10 to 20 Mgm. may be given for a week before the therapeutic test is held to be negative. *Aneurine* should be given to all cases of alcoholic peripheral neuritis and heart-failure. It should also be tried in all cases of peripheral neuritis and myocardial weaknesses of obscure origin".

**Vitamin $B_2$, or Riboflavin, or originally identified as Lactoflavin or Vitamin G.:**—The heat destructible or labile active constituent of autoflaved yeast has been named $B_1$, or Thiamine. The heat stable proportion came to be known as $B_2$. But, later on, it was observed that this $B_2$ was not a single Vitamin. Still further researches established the existence of a water-soluble Vitamin G., which was later on found to be the same as $B_2$. It was for some time only that $B_2$ or G Vitamin were held to be identical. Afterwards $B_2$ was found to have something more in addition to Vitamin G. and Vitamin $B_2$ was found to be complex substance containing several Vitamins, and also an important food factor. The name "$B_2$ Complex" could not continue for long, because, out of these complex Vitamins more and more Vitamins began to be identified. At present the name Vitamin "$B_2$ Complex", is used for several Vitamins (at least 9 or 10 chemical compounds) and the name $B_2$ is reserved for (old Vitamin B.), a pure substance now named 'Riboflavin'. Therefore, Vitamin $B_2$, Vitamin G., Lacto-flavin, and Riboflavin are synonyms of the same substance. The name Riboflavin has become more common, just

29

as Thiamine is now current in place of Vitamin $B_1$. The substance belongs to a group of compounds known as Flavins. It was named Lactoflavin, or Ovoflavin according to its source, milk or egg.

"Riboflavin functions primarily in tissue respiration enzyme systems concerned with oxygen transport. It is readily absorbed from the intestine, has limited storage in the body, and is excreted in the urine. No toxicity has been reported."

**Vitamin $B_2$:**—All cereal foods, roots, tubers, fruits and grains are poor sources of Vitamin $B_2$, *milled rice being the poorest;* because, it is a substance in *rice-polishings,* i.e., the outer coating of rice and wheat. Yet, Vitamin $B_2$, or Riboflavin is widely distributed in plants and animals, and is needed for growth. Similarly as the coatings of all cereals, contain Vitamin B., care should be taken to see that nothing of the coating of the cereals is removed during husking. The more the coating is retained, the better the food value it has. But $B_2$ occurs in eggs, milk, yeast, kidney liver and yellow pigment of tubercle bacillus. Richest sources of Riboflavin are dairy produce, (milk), meat, eggs, liver, fish, tomatoes, peas, cabbage, and spinach and green leafy vegetables. Yeast is usually not as good a source of Riboflavin as wheat germ, but can be made so by being cultivated under certain conditions.

"Plants manufacture Vitamin B. Men and animals derive it from plants. But unlike Vitamin A., plants do not have it in leaves so much as in the seeds, confined in their coatings or outer coverings. It is, however, present in leaves also. The more important an organ is, the more Vitamin B is utilised and therefore stored by it. It is more plentiful in the brain than in the heart, liver, kidneys and other organs of the animals. Organs containing Vitamin B., if used as food supply Vitamin B. *Though hand-pounded rice contains Vitamin B. to a satisfactory extent, if it is also subjected to some degree of polishing, it is no better than milled rice.*

Human system cannot store up a reserve of Vitamin B. It must be replenished daily. That is why doctors urge the eating of some food every day, which contains Vitamin B. Daily requirement is believed to be 1 to 3 Mg.

**Chemistry of Vitamin $B_2$:**—"It crystallises in yellowish brown needles with no sharp melting point; its solubility is slight, (2.5 part per 1,000 at 25°C). It is soluble in fat solvents and is stable in strongly acid solution and unstable in alkalies, when exposed to light or irradiation with ultra-violet light. It should, therefore, be stored in amber coloured am-

poules." Formula of Vitamin, $B_2$ is 6-7 dimethyl 9 ($B_1$ ribitil), isoalloxazine. The Bourquin—Sherman unit is equivalent to 2-2.5 micrograms of Riboflavin. $B_2$ has for some time been recognised as consisting of at least three parts:—(1) *Riboflavin,* —for which the synonymn Vitamin $B_2$ may be retained. (2) Nicotinic Acid, previously known as the PP factor. (3) Pyridoxine, previously known as Vitamin, $B_6$. It is also a water-soluble pigment giving a yellow solution and having a yellow green fluorescence.

**Daily requirement:**—The general requirement of Riboflavin is 1½ times that of Thiamin or nearly 4½ milligrams per day for adults; 450 units (0.9 to 1.2 Mgm.) daily by boys and girls under 6 and 7 years; 7 to 10 years require 540 units (1.08 to 1.32 Mgm.); and adults require 600 units or 1.2 to 2.5 Mgm. up to 5 milligrams even.

**Therapeutic Dose:**—Up to 10 times the above.

**Synthetic Vitamin $B_2$.:**—Riboflavin-5-phosphate, the form in which the body uses Vitamin, $B_2$, can now be synthesized on a large scale. The new process is reported by two chemists of the Hoffman-La-Roche Pharmaceutical Co., at Nutley, New Jersey. In the body phosphorus is added, making Riboflavin more soluble without interfering with its biological activity. It is this soluble compound that the new chemical process produces. Riboflavin-5-Phosphorus will be put to greater use in medical research, since the soluble material can be injected into the blood stream in large quantities than possible before. It also can be administered in liquid drops to babies providing them with an adequate supply of this vitamin. Riboflavin itself is synthesized in large quantities in the United States to enrich bread and other foods. Synthetic Riboflavin-5-Phosphate also has been prepared before, but only in small quantities, and only recently in a pure State." ("India International", January, 1952, page 47).

**Shortage of Vitamin, B., $B_2$., and B. Complex causes:**—Ariboflavinosis; Mal-nutrition; lack of body resistance; taste for unhealthy things; complete deprivation causes Beri-beri or poly-neuritis; while partial lack results in peripherial neurotis and cardiac vascular depression etc., abnormalities; nerve complaints; loss of appetite or depraved appetite (anorexia); dysphagia (with gastric discomfort and malaise) or gastro-intestinal derangement, (diarrhoea, indigestion, constipation, pellagra, mucous collitis and worms); failure of growth, loss of weight, weakness of heart and lack of vigour or lowered vitality; nerve complaints; headache, anaemia and unhealthy

skin; Edema, weakness of eye-sight; conjunctivitis with photophobia, accommodation defects, etc., "Soreness" of the angles of the mouth (Cheilosis) and the tongue; a syndrome characterised by thickening and cracking of the lips and by corneal and by lesions; it occurs most commonly in those whose diet consists largely of milled rice. Rapid cure follows the daily consumption of half to 1 oz. of dried yeast, half to one pint of good milk, or 2 to 3 eggs.

Deficiency of Vitamin B. in a child's diet makes it indifferent, lazy, and predisposed to infection, e.g., tuberculosis and common colds. "Lack of Vitamin B. along with insufficiency of iron in the food of pregnant woman and the mother, has something to do in the production of pregnancy and **puerperal** (after-delivery) anaemias. Therefore, the food of mothers must be rich in Vitamin B., so that they may pass on more of it to the infants they suckle. Shortage of Vitamin B. is disastrous to children.

**Shortage of Vitamin $B_2$. causes:**—Rosacea Keratitis; angular stomatitis; seborrhoea; dermatitis; purple glossitis; fatiguability; lack of growth in children. Administration is said to benefit pernicious anaemia and sprue.

Vitamin B. Complex are all water-soluble.

**Vitamin $B_2$. Complex** is a group including:—(a) Riboflavin: ("Lactoflavin or Lactoflavine, Vitamin G., Vitamin $B_2$.) a water-soluble yellow crystalline substance (pigment) responsible for growth-promoting properties, first isolated from milk (lactoflavin). It is also found in yeast, milk-whey and liver extract. When its phosphate is conjugated with protein, it forms the "respiratory enzyme" of the tissues, which is essential for the oxidation of carbohydrates, aldehydes, lactic-acid and amino-acids. The alkaline solution of Riboflavin deteriorates if exposed to light. *Dose:*—Imperial 1/60 to 1/6 grain; Metric 0.001 to 0.01 grm. Riboflavin's phosphoric acid, ester or *niacin,* or *nicotinic acid,* or *niacinamide,* or *nicotinamide,* or *nicotinic* acidamide ["Pellagra-preventing *factor-(P. P. factor)*,] pyridine-m-carboxylic acid, also consists of white crystals or crystalline powder with a feebly acid taste (for more details, refer Vitamin $B_7$. also). It is soluble in 75 parts of water at 15°C., and readily soluble in boiling water and alcohol (95%.)

**Dose of Nicotinamide:**—Metric 0.02 to 0.1 grm. Imperial 1/3 to 1½ Gr. (B.P.) form an essential part of the active group of various oxidizing enzymes. *Niacin* or *Nicotinic Acid* in doses of 25-200 mg. or more given orally or I.V. improves, within

a few days, Dermititis, Stomatitis, Vincent's Angina, Porphyrinuria, Diarrhoea and nervous symptoms of Pellagra. If initial doses cause cutaneous vasodilatation, itching of the erythematous areas, facial flushing, burning, faintness, sensation of warmth, administration is withheld for 2 days. It prevents porphyrinuria caused by sulphanilamide treatment. *Nicotinamide* or *Niacinamide* which is used to prevent and treat Pellagra, does not cause vasodilation and itching of the skin, as nicotinic acid may do, and so it is preferable to the latter, for hypodermic administration."—(Dr. H.V. Savanur.) The richest sources of Nicotinic Acid are:—yeast, lean meat, offals, especially livers; meat, fish, wheat-germ, soyabeans, whole grain cereals, peanuts, potatoes, dried separated milk, fruit juices, dried eggs, rice, bran and whole wheat. White bread contains smaller quantities than whole meal.

"*Niacin* and *Niacinamide* (P-P Factor) vitamin functions primarily in the CHO metabolism enzyme systems concerned with hydrogen transport and glycolysis. It is a component of respiratory coenzymes I and II."

**Mass Production of Niacin:**—"Niacin is also an important member of the Vitamin B. Group and is used in enriched bread, in Pharmaceuticals etc.; Until now, it has been made from quinoline or pyridine, which are derived from coal during coke production. The output is rather small. A new raw material from which *Niacin* can be produced is two-methyl five ethyl pyridine made by the reaction of acetaldehyde and ammonia. Both chemicals are obtained in tremendous quantities from petroleum and natural gas. The entire demand for niacin could be met from less than a tenth of one per cent of the total supply of these basic chemicals." (Page 19 of April, 1952, "India International", Bombay, 14).

(b) **Pantoyltaurine:** is a substance experimentally found to act on sulphonamide—resistant strains of streptococcus, and on B. Diphtheriae, etc.

(c) **Inositol:**—This factor is essential to mice and like choline is a "lipotropic Vitamin B. Complex Factor" or "Alopecia Vitamin", which prevents or cures fatty infiltration of the liver. It is a normal constituent of all plant and animal tissues. The precise indications of this in animal physiology have not as yet been determined, though it has been suggested that it may be essential, with pantothenic acid, for normal gastro-intestinal functions. "A variety of pathological conditions have been suggested to be due to lack of this Vitamin, the administration of which effects cure or improvement in such conditions. These are alopecia, and 'Spectacle eye' in

rats as well as pruritus, and atrophic gastritis in man. It is also said to inhibit tumour growth and to prevent deposition of fat in liver and other organs in man. Owing to almost universal occurrence of this Vitamin in animal and plant tissues, the deficiency of this Vitamin is not commonly met with in man." "It is believed that deficiency of *Inositol* in animals results in falling of hair, and is a factor for growth and health and for fat metabolism." But, Drs. M. Chatton, S. Margen and Hr. D. Brainerd opine that inositol's role in human nutrition and its use in liver disease are still entirely unclear.

(d) **Para-amino-Benzoic Acid:**—is widely distributed over the entire plant and animal kingdoms. It is necessary for growth and normal pigmentation of animals. As a possible member of the Vitamin B. (complex), it has been studied because of the discovery of its specific neutralising power on the bacteriostatic effects of sulphonamides. After it was isolated from yeast, its essential need for cell-life became more probable. It is recognised as an effective anti-ricketsia agent.

Therapeutically the greatest use of Para-Amino-Benzoic Acid has been made in the treatment of louse-borne Typhus in Egypt and Rocky Mountain spotted-fever in children. It was found that the course of the disease could be favourably modified provided the drug was given within the first week of the illness. Large doses, 24 to 48 grammes daily in four divided doses, every two hours, were found necessary to give a blood concentration between 10 and 20 Mg. per 100 cc.

Toxic reactions were not seen. Average daily dose is about 30 grammes in solution with Soda-bicarb, given in four doses every two hours. In children 2 or 3 grms.

On more or less emperic grounds DRY and others administered simultaneously Para-Amino-Benzoic Acid and Sodium Salicylate to cases of rheumatic fever, which had not responded to a liberal intake of Salicylate alone. The clinical response was dramatic and complete. It has been found that P-A-Benzoic Acid modifies the formation of melanin, the hair pigment and that it darkens the hair of grey-haired persons when given in 100 Mg. doses, twice a day for 6 to 8 months.

(e) **Folic Acid:** (Pteroylglutamic Acid):—Once known by the name Vitamin M. or Vitamin BC. or L. Casei Factor, strictly, is a bright orange-yellow crystalline substance, isolated from spinach, and found to be growth factor for *Streptococcus lactis R. (S. Faecalis)* and for *Lactobacillus casei.* Folic Acid exists naturally in conjugate form in yeast,

liver, kidney, milk, grasses, mushrooms and green leaves. "Folic Acid compounds have been studied under several names and the following are now known to be Folic Acid variants:—Vitamin M; Vitamin BC; Vitamin $B_{10}$; and $B_{11}$, "eluate factor" (from liver), and the *"L. Casei Factor"*. "Recently a compound which is identified with "L. Casei Factor", isolated from liver has been synthesized. Experimental studies indicate that there are at least three or more compounds occurring in natural materials with Folic Acid activity in different species.

**Folic Acid** is also supposed to be pteroyl glutamic acid, having glutamic acid joined by a peptide linkage to the carboxyl of pteroic acid, which in pteridine and P-amino-Benzoic Acid (a compound of Pteridine and Glutomic Acid). It has been synthesized and isolated from liver and yeast, as Vitamin BC. Though active in causing red cell formation, it is not the true 'anti-pernicious anaemia factor' of liver, and it does not prevent the nerve degeneration, which often accompanies pernicious anaemia, Pteroyl diglutamyl glutamic acid (from fermentation residues of certain bacteria), and pteroyl hexaglutamyl glutamic acid (Vitamin BC conjugate from yeast) are also known. It has been suggested that sulphonamides act by preventing bacteria from synthesizing Folic Acid, which is essential for their growth."—(Pages 973 and 974 of Chamber's Technical Dictionary, 1949).

In man so far no instance of natural Folic Acid deficiency has been described. In the experimental animals, the outstanding feature of Folic Acid deficiency is leucopaenia.

Folic Acid seems essential for the metabolism of bone marrow cells of all series. It is used for the treatment of anaemias, which can be grouped under Addisonian pernicious anaemia and some other nutritive marcocytic anaemia (e.g., sprue) accompanying sprue and pellagra, and anaemia secondary to cirrhosis of the liver. It has been found useful in nutritional diarrhoea and coeliac disease. Non-megaloblastic, macrocytic anaemias do not respond to liver extract, and therefore Folic Acid will not replace liver-therapy in all cases. Folic Acid is of no value in iron-deficiency anaemia, in anaemia due to hypoplasia or aplasis of bone-marrow, in leucaemia and certain other megaloblastic anaemias.

"The need of Folic Acid in human nutrition has not been established. Indications are that it plays a fundamental role in blood formation. The synthetic compound has been reported to have anti-pernicious anaemia activity when administered in large doses; but there is no evidence that it is

identical with the anti-pernicious anaemia factor in liver extracts. It has also been effective experimentally in other macrocytic anaemias, nutritional anaemia and anaemia of pergnancy and sprue". (Moor, 1945; Sharp, 1943).

10 to 20 Mgm. of Folic Acid by mouth daily causes the following effects in pernicious anaemia; prompt reticulocytosis within 5—10 days, change of megaloblastic bone-marrow into normoblastic one and improvement in all clinical symptoms except those of the C.N.S. The peak response in reticulocytosis is rather weaker than that with patent liver extract and though the regeneration of Hb. and R.B.C., at the start is as good as with a patent liver extract, the maintenance is not so good as with liver extract. Neurological symptoms do not improve and may actually arise during Folic Acid Therapy. *Folic Acid should, therefore, be never used by itself in pernicious anaemia.*

Folic Acid is also useful in nutritional macrocytic anaemia, macrocytic anaemia refractory to liver therapy and in sprue and idiopathic steatorrhoea. In the last two, there is clinical improvement without any effect on fat absorption and without any definite haematological response.

10 Mgm. of Folic Acid by mouth is eqivalent to 6-23 Mgm. of Vitamin $B_{12}$, intramuscularly. (Dr. V. N. Ashtaputre, M.S., in Magazine of 'Miraj Christian Medical School', March, 1951, p. 24).

Hamilton Fairley in "Practitioner", October, 1947, reports the efficiency of Folic Acid in tropical sprue and anaemia, and Black and Stanbury report in "Lancet", dated 14-6-1947, two cases of agranulotosis said to have been cured by Folic Acid. Further clinical research re. these diseases by Folic Acid treatment is needed to arrive at final conclusions.

N. B.:—A comprehensive review of the development of Knowledge about Folic Acid has been published by Drs. Berry and Spies and another, appears in UNRRA Bulletin.

(f) "Choline occurs in nature as a constituent of phospholipids, is a methyl donor, and is related to the metabolism and distribution of fats. It has been termed a 'lipotropic' growth factor, being concerned in the prevention and restoration to normal of livers, affected by fatty infiltration. It is essential for the metabolism of natural fat and cholesterol. It has a lipotropic action and helps the liver in the transport and utilisation of fatty acids. It maintains normal kidney structure. It protects the liver from the action of toxins and

poisons; and its deficiency plays some role in the causation of cirrhosis of the liver.

In ordinary mixed diet of man its deficiency is unlikely to occur owing to wide distribution of this factor in animal and vegetable foods, yeast egg-yolk, nerve tissues; liver and wheat germ, which are rich sources of these Vitamins, though it is also present in green and leguminous vegetables; milk is however not a rich source and the suggestion that a diet of cow's milk and a B. coli infection may be responsible for infantile cirrhosis of liver, merits consideration".

"Choline is essential for certain other functions in animals such as, normal nutrition of the chick and for egg production, for the prevention of perosis or slipped tendon in the birds and for the lactation and normal nutrition of rat. In addition, Choline is utilised in the animal organism for the formation of acetyl-choline. Choline requirement of dog is about 35 mg. per kg. of body weight daily; that of chick is 75 mg. daily. Generally speaking, the young growing animal needs more of it than the adult. Dogs made artificially diabetic have also been found to require Choline",—("Treatise on Tropical Therapeutics", 1950). Large doses of Vitamin B. (Complex) along with protein diet were used by Patak and others in the treatment of cirrhosis of the liver and good results have been claimed with this treatment. The diet given contained proteins 139 grm., fat 175 grm., and carbo-hydrate 365 grm.; total caloric value 3600. Yeast is given in doses of 25 grm. daily. Vitamin B. is injected daily in doses of 5 mg. and a crude concentrated liver extract (5 cc.) is injected twice weekly. Choline has proved useful in two cases of Icterus gravis neonatorum. It was given in doses of 5 grm. daily. Choline is changed into Acetyl Choline in the body.

D. S. Balasundaram of Madras reports in "Indian Medical Gazette", December 1947, the good results occurred in cirrhosis of the liver, both of the adult and infantile type, by treatment with a standard patent Choline preparation.

Therapeutic doses of Choline have been administered orally and intravenously in the form of Choline-chloride, 0.33 grm. to infants daily, and from 1 to 8 grm. to adults. Since Choline is known to be a circulatory depressant *its parentaral administration is not without danger. Orally too, it should not be given on a fasting stomach.*

The latest advance in the treatment of cirrhosis of the liver in the adults consists in the administration of Methionine 2 grms. daily, and Choline-chloride 2 grms. daily. Special liver extracts enriched with Vitamin B. (Complex)—patent

preparations manufactured by reliable Firms, may also be given, strictly according to instructions therewith, for cure.

> **N. B.**:—The question has been raised whether Choline should be considered a Vitamin and a member of B.-Complex. It may later be classed as an independent nutritional factor in its own right. (Dr. H. V. Savnur).

(g) **Biotin,** see **Vitamin H:**—This is the latest member of the Vitamin B-(Complex) group to be synthetised. The deficiency of this factor brings about a synirome characterised by a scaly dermatitis, achengrey pallor, tongue lesions. paras hesiae, nausea and changes in the blood picture. *Avidin*, a protein contained in raw white of egg, produces a complex with the biotin present in diet and prevents its absorption, thus bringing about its deficiency. Good improvement in a case in which dermatitis largely disappeared and the serum biotin returning to normal, has been reported under a liberal diet and injections of methylester of biotin.

Good sources of biotin are yeast, cereals, peas, groundnuts, meat, liver and eggs. Biotin increases in cereals during germination. An ordinary diet supplies about 30 to 40 mg. of biotin daily. "Yeast forms one of the best sources *of all the B. Vitamins.* $\frac{1}{4}$ to 1 oz. of an average yeast should supply the daily adult requirements (about 500 I.U. or 1.5 mg.) of Vitamin $B_1$. It is possible to obtain yeast specially rich in Vitamin $B_1$ so that the daily requirement is provided by as little as 2 grammes".

> **N.B.**:—All the above are water-soluble Vitamins originally distinguished from $B_1$, by their greater heat-stability.

**Vitamin B**. (**Pantothenic Acid** or bios IIA.)—has been identified as the "chick anti-dermatitis factor" or the "Liver-filtrate factor".

**Sources are**:—Yeast, eggs, whole wheat, peanuts and liver. Isolated from raw liver. Also made synthetically.

**Daily requirement and Therapeutic dose**:—5 to 10 mg.

This was found to cause a decrease in the capacity of liver tissues to oxidise pyruvate, and possibly is a component of enzyme systems active in connection with pyruvate metabolism, with P-Amino-Benzoic Acid and biotin; its importance as an anti-grey hair factor has been mentioned.

Pantothenic Acid has been found efficacious in peripheral neuritis unrelieved by other B. Vitamins, and is necessary for growth in rates, but its role in man is not known. In

Beriberi its blood level is 20 to 50 per cent below normal. "Pantothenic Acid apparently closely allied with the cumulative effect of Vitamin B-Complex and has been shown to have a synergistic effect in the human system in association with Riboflavin."

Pantothenates are essential for the metabolism of micro-organisms, and efforts have been directed to synthetise substances very similar to Pantothenate, which will starve micro-organisms of a substance essential for growth. Has been of therapeutic value in the treatment of certain anaemias. "Though Pantothenates have been employed in men, their *precise indications* have not been determined".

**Chemistry of Vitamin $B^3$:**—Little is known of this factor beyond the fact that something occurring in dried yeast and wheat embrayo is necessary to prevent loss of weight in pigeons fed on a diet of polished rice supplemented with liberal amounts of Vitamin B.

**Stability of Vitamin $B_3$:**—This factor is thermolabile.

**Results of shortage:**—Possibly contributes to pellagra; rats develop a dry scabby skin and thinning of the hair, (leads to atrophy of Suprarendle in rats); chicks develop dermatitis and degeneration of the spinal cord. Though detailed effects on man are not yet known, the substance is said to be necessary for health.

**Chemistry of Vitamin $B_4$:**—This factor is found in bakers' yeast and can be separated from the watery extracts of Vitamin $B_1$, by absorption on Norite Charcoal at P.H.1.O. It is a base and forms a crystalline hydrochloride of the composition C4H4N4, HCL, $\frac{1}{2}H_2O$. It is precipitated by phosphotungstic acid (p. $H_2O$ to 4.0), mercuric sulphate, picric acid, picrolonic acid and gold chloride. Pauly and nitroprusside tests are negative.—(Page 749 of Martindale's Extra Pharmacopoeia, Vo. II).

Symptoms of Vitamin $B_4$ deficiencv in rats are different from the symptoms of $B_1$ deficiency. Vitamin $B_4$ has not yet been shown to be necessary for human beings. "A specific type of paralysis in rats and chicks results from the lack of this Vitamin, *the existence of which, however, is doubtful.* This may be identical with other known factors. Recent work identifies it with the aminoacids arginine and cystine". (Page 112 of Treatise on Tropical Therapeutics" (1950).

**Stability of Vitamin $B_5$**—which is thermolabile, is most stable in 20% acetone-water solution at P.H.3.O.

**Vitamine** $B_5$:—This alkali-heat-stable, water-soluble factor is necessary for the growth, (weight-maintenance), and well-being of pigeons, is also now thought to be the same substance as Vitamin $B_6$, or Pyridoxine.

**Vitamin** $B_6$: (Pyridoxine or Pyridoxin; Pyridoxine hydrochloride; Adermin; Bitamin $B_2$, is also a pyridine derivative and forms one of the new (fraction of the) factors of the originally known as Vitamin B-Complex, or Vitamin $B_2$ Complex.

Pyridoxin or Pyridoxine is a white, odourless, crystalline powder with a bitter taste, melting at 157° to 160°C. with decomposition; soluble in water and alcohol, stable to heat and alkalies, but destroyed by light. Pyridoxine may be concerned in oxidations and possibly in haemoglobin formation. This Vitamin before its isolation in 1938 was given a variety of names by different workers including "factor Y" or "factor 1", or "Vitamin H" and the "rat anti-dermatitis Vitamin" or factor or adermin.

**Pyridoxine Hydrochloride**—also occurs as a white odourless crystalline powder with a saline taste, and a melting point of 206° to 208°. It is soluble 22 to 100 of water, 1.1 in 100 of alcohol (95%) and slightly soluble in other solvents; stable to light and air.

**Pyridoxine** or **Pyridoxin**—occurs naturally in cereals; seeds, yeast, rice-bran and rice-husk; peanuts; egg-yolk; liver etc., and may be prepared synthetically as 2-mythyl-3-hydroxyl-4: 5 dihydroxy-methyl-pyridine.

**Uses:**—Vitamin $B_6$ is known to be required for growth of certain micro-organisms and said to be needed to maintain muscle tone in certain parts of the digestive tract. In human nutrition, Vitamin $B_6$ has been found to relieve symptoms (characterised by extreme nervousness, tremors, insomnia, irritability, rigidity, abdominal pain, weakness and difficulty in walking) in patients whose typically pellagrous and neuritic condition had been cured by Nicotinic Acid and Vitamin $B_1$, or where Niacin had failed, but whose diet had remained unchanged and whose unhealthy condition had obviously been due to a lack of several factors", and "useful in skin disease, cheilosis, anaemia, muscular distrophy and Parkinsonism, arsenical peripheral neuritis and chorea, angular stomatitis and migrane of pregnancy.

Vitamin $B_6$ probably assists in the metabolism of unsaturated fatty acids. Recent evidence has indicated that when equal doses of pyridoxine hydrochloride and thiamine

hydro-chloride are administered in substantial therapeutic dosage by mouth, many cases of hyperemesis gravidarum are relieved of their excessive nausea and vomitting". Oral doses have varied from 50 to 250 Mg. daily; injection from 50 to 100 Mg. daily, or every other day. No definite range seems yet to have been determined.

**Dose:**—50 to 100 Mg. daily. Vitamin $B_6$ is required in increased amounts during pregnancy.

**Pyridoxine Hydrochloride:** is stated to improve muesthenia gravis, muscular dystrophy and paralysis agitans.

**Results of shortage and absence:**—The skin manifestation (characteristic dermatitis) of pellagra are at any rate partly due to Vitamin $B_6$ shortage, which has also caused epileptiform convulsions in rats; "rat-acrodynia" characterised by dermatitis of the paws, nose and ears; defective growth in chicks; pigeons develop digestive disturbances; hypochromic anaemia in dogs.

**Vitamin $B_7$:**—has the same functions of the popularly known Nocotinic Acid or as some put it as Niacin to distinguish it from Nicotine of tobacco. It is prepared by the oxidation of Nicotine or by laboratory synthesis. Nicotinic acid is present in most forms of animal and vegetable life. (See also:—Vitamin $B_2$ Complex).

Nicotinic Acid (Niacin) is B-pyridine B-carboxylic Acid and its amide-nicotamide is a compound of complex systems of enzymes.

Nicotinic Acid is a white crystalline solid melting at 228-229°C.; it is soluble in hot water and alcohol. It is one of the most stable of Vitamins and is not destroyed by exposure to air, cooking, light or alkalies. It can be sterilized by autoclaving. Being an acid it forms salts.

**Daily requirement of $B_7$:**—In man about 30 to 60 milligrams; minimum requirement to prevent pellagra is 8 to 16.5 mgm. (0.12 mgm per kilo) daily.

**Therapeutic Dose:**—Up to 1000 milligrams daily; but effects must be watched; toxic effects are flushing, dizziness, headache and nausea.

**Shortage of Vitamin $B_7$:—(a-niacinosis) causes:**—Pellagra (other Vitamins also lacking); mental confusion; glossitis.

**Administration benefits:**—Vincent's angina, delirium tremens (500 mg. dosage), angina pectoris, coronary sclerosis; bronchial asthma; Nicotinamide has lately been tried on dia-

betes with good results, which according to Gordon (B.M.J. 14-6-47) depend upon the amount of functioning pancreatic tissues. In the treatment of pellagra the effective oral dose is about 500 mgm. daily. In order to avoid unpleasant side effects, it is recommended that this dose be divided into 10 smaller doses of 50 mgm. each. If intravenous administration is necessary, the total daily dose may be reduced to 80 mgm. When marked improvement occurs, the dose may be reduced to 100 mgm. daily by mouth. Besides pellagra, nicotinic acid is used in stomatoglossitis, sprue and allied conditions, lenkoplakia, pruritis, lupus erythematosis, eczema, psychosis, due to defective nutrition, meniere's disease and sulphonamide intolerance in doses of 150 mgm.

**Vitamin $B_8$**:—(Adenylic Acid)—Adenylic Acid or Adenosine Monophosphate, a complex of Adenyne, Ribose and Phosphoric Acid, is widely distributed in nature, in cereals, glandular tissues and yeast, from which it can be extracted. It is said to be essential for the phosphorylation of glucose, Adenelic Acid being first converted into Adenosine Triphosphate, which transfers its labile phosphate to glucose. That the energy of muscular contraction is derived from the breakdown of Adenosine Triphosphate is supported by evidence, this reaction being catalised by Calcium ions. Ruskin reported success with iron Adenylate in the treatment of agranulocytosis following chemotherapy. It is stated that Adenylic Acid enhances the effect of Vitamin $B_1$, in cases refractory to treatment with the latter alone. Adenylic Acid inhibits bacterial growth. Spies and collaborators reported that Adenylic Acid has a powerful pharmacological action. Rapid clinical improvement has also been reported by these observers in patients suffering from malnutrition, pellagra, and peripheral neuritis with Adenylic Acid; these patients failed to respond adequately to yeast, and large doses of Vitamin $B_1$, and P. P. Factor. However the evidence for its status as a Vitamin in human nutrition is lacking.

**Vitamin $B_{10}$ and $B_{11}$**:—These two Folic Acid variants chemically unidentified water-soluble members of the Vitamin B Complex, are stated to be necessary for growth and proper feather development in the chick. These factors may be identical with Vitamin Bc.

**Vitamin $B_{12}$**:—(Lactobacillus lactis Dorner factor) is a red crystalline substance isolated from liver and other natural sources, believed to be the substance, absence of which causes pernicious anaemia. Minute doses prevent both the blood and nerve changes characteristic of the disease. "It is a phos-

phorus and cobalt containing material isolated from purified liver extract. "Vitamin $B_{12}$ given orally produces height and weight gains, increased physical vigour, alertness, better general behaviour, definite increase in appetite, and the vanishing of severe allergic bronchitis in physically retarded children". ("Science", 110-651, 1949 of New York).

Modern research has led to the discovery of this important fraction in liver, which is so powerful that 1 mgm. of this is equivalent to 1 U.S.P. unit injectable liver, which is on an average the daily amount of liver extract needed for satisfactory response in pernicious anaemia. The crystals of Vitamin $B_{12}$ contain 4% cobalt and the red colour is probably due to them. The exact significance of this on erythropoiesis is not yet definite. The preparation of this Vitamin is extremely difficult, since 4 tons of liver yield only 1 gramme of Vitamin $B_{12}$. In this connection, it is most interesting to note that streptomyces grisens, which produces Streptomycin also produces Vitamin $B_{12}$ and this fact has been taken advantage of commercially. Liver extracts of high potency containing 10 mgm. per cc. of this Vitamin or more give satisfactory results, but not those containing lesser percentages.

Administration of Vitamin $B_{12}$ in pernicious anaemia leads to a characteristic response clinically and haemotologically. The drug has the same beneficial effects on neurological symptoms as liver extracts, and is safe as far as any allergic manifestations are concerned. It may be the extrinsic factor is identical with Vitamin $B_{12}$. Oral administration of Vitamin $B_{12}$ is more effective, if coupled with normal gastric juice, but even then this is less effective than the Vitamin administered by injection.

Vitamin $B_{12}$ is also of good use in nutritional and tropical macrocytic anaemia and in sprue.

40-80 mgm. weekly for the first three months and then 30 mgm. every week afterwards is a good regime. Patients with neurological symptoms should receive larger doses. (Dr. V. N. Ashtaputre M.S., in "Miraj Christian Medical School Magazine, March, 1951, pages 24 and 25).

**Vitamin Bc:—(See Folic Acid):**—Vitamin Bc is a Folic Acid variant, also known as the chick anti-anaemic factor, because, deficiency of this Vitamin causes a nutritional anaemia in chicks; cures a condition of dietary deficiency in pigeons, in which these refuse to grow and develop an anaemia, characterised by a decrease in the percentage of haemoglobin and red cell volume; this condition is also curable by liver extracts. This has been isolated in crystalline form from liver and yeast.

Given orally it protects rats against the hypochromic anaemia induced by sulphone drugs, e.g., promine, prominzole, diasone, etc. Recent work identifies this Vitamin with Folic Acid. All the different Vitamins of this B. Group appear to be closely related to metabolic processes in the body. Broadly speaking, the more work we do, the more of the B-Vitamins we require".

> N. B.:—"The role of Pantothenic acid, Adenylic acid, Para-aminobenzoic acid, Biotin, and Vitamin U, in humans, is at present undetermined and none have as yet been proven to be of therapeutic value."—(Hand-Book of Medical Management).

**Vitamin C:** The Antiscorbutic, or (Lexuronic Acid), Scurvy (infantile and adult) preventing Vitamin or water-soluble Vitamin C, Ascorbic Acid of B.P., or Cevitamic Acid is one of the most sensitive of all the Vitamins. It is obtained from the ripe fruit of Capsicum annum (*paprika*) and other vegetable sources, or by synthesis. It is a valuable substance in the forming of the blood and also acts on the skin.

*Copper utensils, air-contact, alkalinity, drying by moderate degrees of heat, cooking, or ageing, all reduce or destroy Vitamin C content of foods.* Ascorbic Acid is a white crystalline substance; very easily oxidised in solution, especially in neutral or alkaline solution; the oxidation is greatly accelerated by traces of copper, and is probably concerned in oxidation-reduction reactions in the living organism. Hence, dry or stale vegetables lose their Vitamin C. Pasteurisation of milk (150°F.) and quick boiling of milk or vegetables entail a loss of about 20 to 40% in the Vitamin C. content of milk or vegetables. As Vitamin C. is so easily destroyed, artificially fed infants should be given orange juice or tomato juice from the third month onward. Older children and adults should take some fresh fruits, (fruit juices), and green vegetables, preferably raw, along with their usual diet. On account of the danger of transmission of dysentery through raw vegetables, it is necessary to wash them thoroughly *in boiling water.* When the supply of green leaves, vegetables or fruits is deficient, sprouted peas and germinated wheat, grams or *mung,* should be taken *raw,* in addition to the usual diet. These sprouted grains may be added to vegetable curry just two minutes before it is removed from the fire. Fresh lemonade has more C., if the lemon juice is added last, when the liquid is cold. Milk and meat possess a definite but low anti-scorbutic value. The anti-scorbutic Vitamin differs from the anti-neuritic one in its distribution and properties, as well as in the nature of its influence to nutrition. This Vitamin is less

wide-spread than the anti-nutritic Vitamin and is more sensitive to heat and drying than the anti-neuritic one; prolonged cooking or to cook vegetables twice is a fatal mistake, *while the addition of soda renders them useless from the Vitamin standpoint.* Tinned fruits, which have been raised to a temperature of 120° C. lose their anti-scorbutic properties; so also the bottled and dried fruits. In short, Vitamin C. disappears rapidly from foods, when these are preserved and stored. This Vitamin is more sensitive to heat than A. or B. It has also been shown that although pulses and cereal grains in the ordinary stage contain no Vitamin C., and dried pulses and grains contain no anti-scorbutic principle while still dry; but Vitamin C. develops in 48 hours, if they are moistened and allowed to germinate or sprout". The sprouted grains should be eaten raw, or ground into paste and water extracted or after cooking for not more than 10 minutes. In all dry and stale foodstuffs and preserved vegetables, most of the Vitamin C originally present gets destroyed. The tissues of fresh vegetables dried at low temperature or their expressed juices preserved in the cold rapidly lose their anti-scorbutic property. When fresh vegetables and fruits are not easily obtained, sprouted grains may be used as a cheap and easily available source of Vitamin C. Sprouted pulses may contain 10 to 15 milligrammes of Vitamin C. per 100 Grammes. A well balanced diet for school-children and adults, should contain some 30 to 50 mgs. of Vitamin C per day. Any loss of Vitamin C caused by the prolonged cooking or cooking twice may be made up a little, by inclusion of a few ounces of fresh fruits, and leafy and other vegetables in the diet. Scurvy is common enough among children fed on tinned foods. *In the case of infants fed on mother's or cow's milk, boiled fresh milk or reconstituted dried milk, special attention to Vitamin C. requirements is necessary.* These can be supplemented by giving orange or tomato or lemon fruit juices, in small quantities. "Like Vitamins A. and B., Vitamin C., which is an auxiliary to Vitamins A. and B. also is stored by the liver. So carnivorous animals obtain their supply of these three Vitamins from the liver and blood of their prey. The white inside of the peel of the oranges is particularly rich in Vitamin C. Regarded as a source of Vitamin C. animal food is no good. Eggs have no anti-scorbutic property; liver has but very little of it. The quantitative presence of Vitamin C in milk depends upon the green fodder, which the cow consumes."

Vitamin C. is necessary in abundant quantity to keep the blood pure, teeth, bones, gums and generally the whole of the body in health.

**Shortage or deficiency of Vitamin C. causes:**—Scurvy, (reddish skin eruptions); sallowness, malnutrition, loss of appetite, vigour, weight, fleeting pains in the limbs and joints, in adults; growing pain in infants and children, which make them cry whenever they are handled; lowered resistance to infection; difficult healing of cuts and abrasions; anaemia; lassitude; fretful temper; poor digestion; bleeding from mucous membranes or haemorrhages from any part of the body; pyorrhoea; (spongy bleeding gums, loosening of the teeth); ulceration of stomach and bowels (even peptic ulcer); enlargement of heart; and degeneration of sex organs and capillary walls; some forms of infantile cataract; impairs cellular oxidation, reduction and formation of red-blood-cells.

**Newer scientific knowledge of Vitamin C:**—"It was discovered sometime ago that a hexuronic acid obtained from suprarenal glands was identical with the substance made out of lemon juice as Vitamin C. This synthetic substance is called ascorbic acid. As this has got reducing property, real lime juice can be easily distinguished from the artificial product which has no ascorbic acid and, therefore, no reducing property. The availability of the pure chemical substance as ascorbic acid has made the determination of Vitamin C. content of food materials in terms of the pure product possible.

"The requirement for health in adults has been put at 40 milligrams of ascorbic acid, and the minimum requirement to prevent scurvy is one ounce of lemon juice or 20 milligrams of ascorbic acid. If more than the requirement is ingested, the quantity in excess of the saturation comes out in the urine. Later researches have shown that the effect of ascorbic acid deficiency is observable in many directions even before scurvy may appear. It is now known that Vitamin C exerts a great influence on the structure of tissues, regulates intra-cellular cement substance of capillaries, promotes the growth and ripening of the white and red blood cells, and its want causes widespread degenerative changes in the body. Therefore, the system should be kept always saturated with Vitamin C. by the intake of juices of raw leaves or fruit-juices in sufficient quantities". "Most people think of orange juice as the one provider of Vitamin C., but a double order of tomato juice is of equal value".

"The amounts of ascorbic acid in milligrammes per 100 grammes are as under:—

Orange and lemon juices—60; apples, 3; banana, 15; grapes, 3; cabbage, 100; potato, 20; lettuce, 5; Human milk, 6; Cows' milk, 2."

"Vitamin C (Ascorbic acid) is also made synthetically."

Vitamin C. condenses with aldehydes, acetone and other ketones in the form of minute colourless crystals with acid taste, readily soluble in water, melting at 192° C. When dry and protected from light, it is stable even in tropics. Autoclaving at 120° C. for 20 minutes in oxygen at pH 8 results in loss of 49%; solutions of Vitamin C. can be stabilised by addition of small amounts of fruit acid, such as tartaric or citric acid. Vitamin C. is 1-ascorbic acid; dehydro-ascorbic acid is as potent an anti-ascorbutic as ascorbic acid. The I.U. is 0.05 mgm. of pure 1-ascorbic acid and 1.0 mgm. of Vitamin C.—20 I.U., but this standard is not now used.

Dose:—Prophylactic (daily) 500 to 1000 Units, Imperial 2/5 to 4/5 Gr. Therapeutic (daily), 2000 to 5000 Units; Imperial, 1½ to 4 Gr.

It is a colourless compound, soluble in water and possesses marked reducing properties. It is easily oxidised and can be converted back into ascorbic acid by reducing agents. It probably plays an important part in transport of hydrogen in cell metabolism. Deficiency of this substance causes scurvy.

Ascorbic acid (Vitamin C) occurs in all growing vegetable tissues, germinated grains, green leafy vegetables and fresh fruits (especially in cashew, limes, lemons, oranges and other citrus fruits, black and red currants, grape fruits, strawberries, apples, cabbage, carrots, tomatoes, yellow turnips, potatoes, bell-peppers, spinach, onions, paprita, etc.); contain large quantities of this Vitamin and smaller quantities are contained in fresh meat, green vegetables, potatoes and milk. Unripe seeds, e.g. green peas, contain ascorbic acid, which disappears when they ripen and dry, but reappear when they germinate. Lemon, grape-fruit and orange juice contain 300 to 350 I.U. per ounce. Cashew fruit contains nearly 6 to 8 times the amount of Vitamin C., as is contained in oranges. '*Paprika*', a variety of cayenne pepper also contains 4 times Vitamin C., as is contained in lemons. A pint of average commercial milk contains about 5 Mg.; raw fresh milk contains about 14 Mg. of Vitamin C. Fresh orange juice contains 50 Mgs. per 100 Mils (3½ ozs.).

"**Emblica officinalis: (Indian gooseberries; Amla):** is perhaps the richest natural source of Vitamin C. Its fresh juice contains nearly 20 times as much Vitamin C. as orange juice, and a single fruit is equivalent in Vitamin C. content to one or two oranges. Though heating and drying of fresh fruits or vegetables usually leads to the destruction of most or all the Vitamin C. originally present, *Amla* or Neelikai is an

exception among fruits, because of its high vital Vitamin C. content, and because it contains substances, which practically protect the Vitamin from destruction by heating or drying, as its juice is strongly acid, and acidity has a protective action on Vitamin C. Hence it is possible to preserve *Amla* without losing much of the Vitamin. Fresh *Amla* was found to be most effective cure for scurvy when an outbreak of the disease occurred in 1940 in the Hissar Famine Area. Tablets made from *Amla* powder contain Vitamin C. in concentrated form, which is a convenient method of preserving the fruit for future use".

It is present in many fruits juices and vegetables, but the amount rapidly decreases on storage, due to the presence of an oxydose enzyme in the plant juices. Human milk contains 4 to 8 mgm. per 100 cem; cow's milk 1 to 26 mgm. and pasteurised milk under 1 mgm. The body can store ascorbic acid, and depends for its supply on fresh vegetables. This Vitamin has been definitely proved to be a protective against scurvy.

"Ascorbic acid participates information and maintenance of intercellular (cement) substance of all connective tissue (deutins cartilage, matrix of bone, collagen of fibrous tissue). It also transports hydrogen in cellular metabolism and is an active reducing agent. It is readily absorbed and excreted in the urine. It is apparently concerned with formation of adrenal cortical hormones. No toxicity has occurred in oral doses of 6 Gm. daily."

Ascorbic acid is very unstable and is destroyed on heating, cooking or drying. It is however, fairly stable, *even on cooking,* in the rind of citrus fruits and in tomato juice. Ordinary cooking destroys most of it in vegetables and the duration of the heating is more important than the temperature to which they are raised. Cabbage loses about 80 per cent of its ascorbic acid content by heating to 100° C. for 20 minutes or by heating to 60° C. for an hour.

In scurvy osteoblast and odontoblast activity is normal, and failure of connective tissue cells to form supporting tissues leads to thinning of bones and teeth. It is said that within 24 hours of administration of ascorbic acid, improvement begins to take place. It is claimed that utilisation of ascorbic acid is higher than normal during infective processes and that it may be of significance in resistance to bacterial infections. In scurvy with severe anaemia, reticulocyte crises ensue soon after administration of ascorbic acid, suggesting that it may be an essential factor in haemopoesis.

Anaemia is frequently associated with scurvy and reacts well to ascorbic acid as do other forms of nutritional anaemias. It is also essential for wound repair and is present in young granulation tissue and adjoining skin.

In mild cases of infantile and adult scurvey, oral dosage is sufficient, and usually given in the form of lemon, orange, or tomato juices. But, in severe cases, intravenous or intramuscular injections, daily of 50 to 100 Mgs. dissolved in 5 CC of Normal Saline solution are given; it is always desirable to neutralise the acid before use, by adding to the solution half these weights of Sodium Bicarbonate.

There is some evidence that Vitamin C. has an effect on the production of anti-bodies against bacterial infection. It also possesses bactericidal and bacteriostatic properties and inactivates certain toxins such as B. *dysenteriae,* Cl., *tetani,* and Cl. oedematiens. It is also concerned with complement activity of serum.

It is suggested that Vitamin C. is a component of reversible oxidation-reduction system acting as a hydrogen transporter of respiratory catalyst. This Vitamin is especially abundant in the corpus luteum, the adrenals, the pituitary gland and other glandular tissue. It is said to stabilise the hormones and in scurvy symptoms resemble adrenal deficiency. It may antagonise thyrotoxin.

Administration by mouth has no effect on the blood sugar, but intravenous injections lower it in normal persons. Vitamin C. is essential for synthetic processes within the cell. It is absorbed by the intestines, and if this is interfered with, the diseased condition results. This Vitamin is stored in organs and tissues with high metabolic activity (adrenals are richest). Its blood range is 0.6 to 2.5 Mgm.

The bulk of Vitamin C. is excreted by the urine, small quantities in sweat and faeces. When the tissues are saturated with large doses, the urinary excretion rises. Daily excretion of 13 Mgm. is borderline between deficient and adequate intake.

The indispensable minimum is 25 to 30 mgm. per day (0.4 to 0.5 Mgm. per kilo); 26 mg. of ascorbic acid or 520 I.U. is considered a normal maintenance ration and this is supplied by about 2 ounces of lemon, or grapefruit or orange-juice; the optimum is 50 to 75 Mgm. daily but even larger quantities are needed during pregnancy and in acute infections. It should therefore, be regularly supplied, otherwise there is deficiency. Boys up to 15 years require 90 Mgm. daily and adults 30—100 Mgm.

Some authors state the daily requirement to be about 75 milligrams (15000 units); at least 15 Mg., and the therapeutic dose about 1000 milligrams daily; 50 to 100 in infants. Pure ascorbic acid is supplied in 25 and 50 Mg. tablets When treating patients in whom deficiency is suspected, it is well to give 100 Mg. a day for several days, and 50 Mg. a day for longer periods. Ampoules are available for injection, but absorption by mouth is usually satisfactory".

Uses:—In scurvy and diphtheria it is specially useful. It has also been used in febrile conditions of pneumonia, paroxysmal haemoglobinuria, whooping cough and other fevers, tuberculosis, rheumatism, typhoid, malaria, dental and oral conditions, dermatitis, arsenical dermatitis, psoriasis, haemorrhagic diseases (capillary, haemorrhages) pernicious anaemia, during pregnancy and lactation, congestive heart failure, gastroduodenal ulcer, and eye conditions, including cataract; peptic ulcer and ulcerative collitis; extreme debility and to hasten the healing of operation wounds or wounds of any kind; sulphonilamide poisoning.

Most of the dietaries of the tropics are quite well-supplied with anti-scorbutic substances and therefore, scurvy is seldom found in India.

The susceptibility to scurvy varies widely for different kinds of animals. Guinea pigs develop typical scurvy after 3 weeks without green food; human beings take a much longer time to develop the disease. Rats, mice, cattle and fowl appear quite unsusceptible; apparently they are able to manufacture the Vitamin (in their liver).

In infancy and pregnancy, ascorbic acid deficiency may be corrected by giving ascorbic acid tablets. The richest palatable source is fresh orange juice which contains 10 Mgm. per 100 cem; tomatoes contain 13 to 39 Mgm. per 100 Cem.; apples contain little, but cabbages, cauliflower and fresh potatoes are good sources.

Probably less than 25 Mgm. of ascorbic acid per day is inadequate even for infants and an intake of at least 50 Mgm. should be aimed at in adults. In the presence of bacterial infections 100 to 200 Mgm. and during pregnancy 100 Mgm. is probably the minimum. The adrenal cortex liver and kidneys store reserves of ascorbic acid, excess of which is excreted in the urine at an average rate of 10 to 25 Mg. daily.

The liver of infants at birth is rich in ascorbic acid, which becomes depleted if the child is breast-fed, more rapidly if fed on cow's milk, and very rapidly if heated or preserved

milk is given. All active tissues contain ascorbic acid. Actively growing tumours are rich in it, and its high utilisation may possibly be the cause of purpura in these conditions.

Plasma should contain 1 to 2 Mgm. per 100 ccm. and in scurvy, the value falls to 0.7 mgm. or lower. The urine contains at least 25 mgm. in a 24 hour specimen; if less is excreted, its store is badly depleted. Ascorbic acid has been isolated in the pure form from fruit juice, and has also been synthetically prepared. Most animals can manufacture this compound, and hence are independent of any supply in the form of food. Guinea-pig, man and monkey cannot manufacture adequate quantities of ascorbic acid, become diseased, and die unless they obtain a supply in their food.

N. B.:—Apparent Vitamin C. can be distinguished from true Vitamin C. by its different reaction with formaldehyde.

**Vitamin D:**—This Vitamin prevents and cures Rickets, Ostomalacia; Caries of the teeth, and other forms of mineral mal-nutrition; *is known as Dr. McCollum's fat soluble* calcifying anti-rachitic 'Sunshine Vitamin'. Vitamin D has two important actions. It increases the intestinal absorption of calcium and increases the urinary excretion of phosphorus.

Vitamin D. in the diet of infants, increases the utilisation of the injected calcium and promotes the development of the straight bones and sound teeth.—(Dr. T. V. Muthuswami Chettiar, L.M.P., in charge of Muthuswami Chettiar's Hospital, Tirupur P.O. S. I. Ry.) in his article 'Infant Feeding' in February, 1936, of 'Medical Digest', Bombay).

*Vitamin D per se is found only in animals; plant sterols are merely precursors.*

"Bourdillon (1930)—first isolated Vitamin D. in crystallin form and called it Calciferol. *But as the natural Vitamin D. is never crystalline, it is difficult to say, this is exactly Calciferol".* Vitamin D. probably acts by regulating the absorption of Calcium and Phosphate from the intestines; i.e., this Vitamin D. is one of the most important factors in the proper development of the bones and teeth and assimilation and storing of Calcium and Phosphorus contained in the food. Attention must be given to Calcium intake also. Cereals antagonise the action of the Vitamin D., and tend to produce badly formed teeth when this Vitamin is deficient. It is found from experiments that Vitamin D., which is present in milk, is still increased when the milk is exposed to ultra-violet light, either from the Sun or some artificial source. On the other

hand, Vitamin A. which is also an ingredient of fresh milk, is destroyed by the same process. From experiments made, it was also found that one set of chicks fed with milk that had been exposed to ultra-violet light, developed the usual condition resulting from the absence of Vitamin A., while a second group fed with untreated milk, developed normally. Vitamin D. is present in all food-stuffs, which are exposed to Sun's rays in the process of preparation. Vitamin D. occurs mostly with Vitamin A. and is found in abundance in Cod Liver Oil, Halibut Oil and other fish oils (e.g., Salmon, herrings in Western countries, hilsa, King-fish, etc., in India). It is also present in milk, cream, cheese, meat, butter, and yolk of eggs. In the human and animal body, it is formed by the action of ultra-violet rays, carbon-arc, or mercury-vapour, quartz lamp, or direct Sun light on the skin. Similarly, now-a-days Vitamin D. is produced artificially in the Laboratory by such irradiation or exposure of the isolated ergosterol, which is a constituent occurring in minute traces in vegetable oils, milk, yeast, and other foods and oils, which contain ergosterol to a special wave band of ultra-violet rays or light.

Vitamin D. is stored in the liver skin and brain. More Vitamin D. is necessary in the absence of ultra-violet light which irradiates the sterol precursors in the skin.

"Vitamin D. is produced in plants, in food materials and also in animals, *whenever ergosterol is present and is subjected to ultra-violet rays.* Ergosterol is a crystalline compound with a structural formula similar to Cholesterol. When ultra-violet light acts on Ergosterol, a yellow resin is produced. This irradiated Ergosterol is a mixture of Vitamin D. and other non-active products. Continued irradiation destroys the Vitamin. When the bare skin of the body is exposed to the Sun's rays (Sun bath) and ultra-violet spectral rays from a Quartz Mercury Vapour Generator, Vitamin D. is synthesized from Ergosterol in the superficial layers of the skin, i.e., absorbed by the skin and subsequently absorbed by the blood, in the circulation. Also food exposed to such rays absorb and retain Vitamin D. In high latitudes, in winter, this Vitamin has to be obtained from the food. Hence, we can realise the scientific value of exposing infants to the rays of the Sun, after anointing their skin with mustard or cocoanut oil. When oil is exposed to Sun light, Vitamin D. is also formed and is absorbed in the body. Hence Rickets is particularly apt to occur in infants kept in dark houses, while osteomalacia in India is often found among women who keep pardah". *Vitamin D. is not destroyed by any of the processes of cooking and preservation.* But, as Vitamin D. is only obtainable

naturally from animal fats, vegetarians should take plenty of milk, ghee and sun-dried food-stuffs, and expose their bare bodies to health-giving rays of the sun. Infants, young children, pregnant and lactating mothers should be given some additional Vitamin D. in the form of irradiated Ergostrol, if there is reason to suspect shortage of Vitamin D. in their diet. The animal sterol (cholesterol) and the vegetable sterol (phytesterol). subjected to ultra-violet radiation produced Vitamin D. It has now been found that this property is not of cholesterol itself, but of an impurity in it called "Ergosterol". Ergosterol was so named as it was originally isolated from Ergot.

A similar sterol or one closely allied to it has been obtained from a wide range of lower plants, especially from yeast. In fact, the Vitamin D. contents of a large number of food-stuffs and oils may be considerably augmented by ultra-violet irradiation. In other words, it was shown that the active principle or the pro-Vitamin D. was indeed a sterol of an unsaturated and labile type, of which ergosterol is the only known representative. The sterol found in Ergot was one of the most efficient substances and irradiated Ergot sterol or Ergosterol was found to have 200,000 to 700,000 times the Vitamin D. activity of Cod Liver Oil. From Ergosterol minute quantities of the active substance in white needle-like crystals called "Calciferol" or Vitamin D. has been separated. The crystals are insoluble in water, soluble in alcohol and in 50 to 100 parts of vegetable oils. "Calciferol" has become a cheap commercial product, and is being largely used medicinally as the curative factor, Vitamin D. is obtained in this in a concentrated and standardised form. *Over-dose has to be avoided.* Calciferol raises the calcium phosphorus content of blood. The advantages of Calciferol is that in a small bulk in a readily assimilable form, a bigger dose (*but never an over-dose*) of the Vitamin may be administered, which is not possible either with the usual food-stuff or Cod Liver Oil. Calciferol can be given intra-muscularly also. Calciferol is stable at room temperature, but loses its antirachitic properties at 18°C.; it completely dissolves in oil at 80°C. Biological essay is the only method of its estimation. "Calciferol" occurs in all tissues, especially in the nervous system, skin and adrenals. It was originally produced from Ergot, and therefore called "Ergosterol", but is now prepared almost exclusively from yeast".

**Standard of Vitamin D:**—The International Unit of Vitamin D. is the activity of .025 mg. Calciferol, i.e., 1 milligram of Calciferol contains 40,000 units of

Vitamin D. In other words, Vitamin D. Unit adopted by the International Conference is the biological activity of a milligram of the international solution of irradiated Ergosterol, which has been found to be equivalent to that of .025 microgram of crystalline Vitamin D. The minimum daily need is about 100 units a day and the optimum supply is probably about 1000 units a day or 0.025 Mgm.

"There is unfortunately no sure chemical method of estimation of Vitamin D.; it has been essayed biologically. There are two or three methods of carrying out the biological assay". (Dr. U. S. Kini, B.Sc. (Hons.), Oil Chemist, Government Oil Factory, Kozhikode, in "Souvenir of the 5th South Indian Medical Conference, Mangalore, held from 13th to 15th October, 1950, page 34).

**Natural Vitamin D.:**—We are now able to trace the vital processes whereby Vitamin D. is produced in milk and nature, and to follow its transition through many channels to the foods in which it ultimately finds a home for the nutrition of the human race:—The ultra-violet spectral rays of sunshine are chiefly responsible for the origin of Vitamin D. "The radiant energy of these rays actuates the fat particles of plant-tissues and from the sterol radicles produces Vitamin D. This elaboration takes place during the sunlight hours in grass and in the southern seas, a similar action occurs in the teeming millions of minute plant organisms, which inhabit the Upper Sunlit zone. In the former case, part of the Vitamin D. in the grass is stored, after consumption, in the fatty tissues of the animal to form the Vitamin content of butcher's meat, or in milch cows to appear in the fat of the milk. In the latter case, the Vitamin D. content of the marine plant organism is the source of the Vitamin fat of fish and fish liver oil. This natural Vitamin D. initials the normal fixation of Calcium and Phosphorus salts in the skeletal and dental systems, and its presence in optimum proportions in the diet is necessary for the prevention of rickets.—(Dr. John Campbell, Ph. D. Scientific Adviser to the New Health Society, London, in "Natural Vitamin D. in Infant Feeding", in "Medical Digest" February, 1936,—Pediatrics Number.)

**Shortage of Vitamin D. causes:**—Anaemia, nervousness, irritability or fretfulness, loss of power to retain calcium, sweating (malaise accompanied by hypocalcaemia); rickets; osteomalacia; osteoporosis; delayed dentition and dental carries; irregular and abnormal tooth and bone development; laryngismus; stribulus; insufficient sleep; belated standing and walking habits; constipation and bulging of belly in front;

knock-knee or bow-legs; flat foot; curvature of the spine; convulsions; enlarged tonsils; adenoids, etc., in infants and children. With adults the symptoms of these are of acid auto-intoxication frequently terminating in rheumatism; osteomalacia usually occurring in women and complicated by tetany and chronic diarrhoea; neuritis; diabetes; bronchitis and Bright's disease; hypocalcaemia of parathyroid tetany.

**Newer scientific knowledge of Vitamin D.:**—"There are probably several varieties (about 10 pro-Vitamins) of this Vitamin, but all have the same effect and a similar composition; the original Vitamin D. is a mixture of $D_1$., $D_2$., and $D_3$., *"Vitamin D. from plant sources differs chemically and to a certain extent physiologically from the Vitamin D., occurring in animal fats.* Plant Vitamin D. is now termed $D_2$., and animal Vitamin D. is termed $D_3$. Vitamin $D_2$. or Calciferol. is manufactured artificially by 'activating' ergosterol or from irradiated ergosterol and does not occur naturally. Vitamin $D_3$. or lumisterol, from sterol-7-dehydrocholesterol or irradiated 7-dehydro cholesterol; two very interesting points about Vitamin $D_3$., are that it is the form in which the Vitamin is found in Nature; is formed in the skin by the action of the Sun; and its present substance 7-dehydrocholesterol has now been synthesized. Ergosterol is best irradiated in solution, but if alcohol is used, there is liability of its being over-irradiated forming *toxisterol.* The only foods containing pre-formed Vitamin D. are animal in origin; whole milk, eggs, *fish liver oils,* (tunny etc.), animal fats, butter, eggs. milk and liver fats.

**Daily requirements:**—Probably between 500 and 2000 units but varies with the amount of exposure to sunlight. 1 milligram of Calciferol contains 40,000 units. Dose of Calciferol for an infant is 1/2400 to 1/1200 gr. daily. The maintenance dose for an infant is about 700 units; for curing rickets, a bigger dose is necessary, but not exceeding 500 units. Doses of Vitamin D. over 10,000—20,000 I.U./Kg. of body wt. per day may lead to metastatic calcification with nephrocalcinosis. Because, administered in big doses or if continuued fairly long even in a moderate dose, it causes overcalcification in various organs of the body (especially the kidneys) and at the growing ends of bones; an excessive dose may so raise the blood level that some calcium may be deposited in the kidneys as calcium-phosphate stone. In children the first symptom of overdose is loss of appetite, followed by diarrhoea, which indicates that the dose should be reduced. But, such an event is not likely with ingestion of Vitamin

D.—containing food ,but may result from concentrated medicinal products.

One egg is supposed to provide the whole of the daily requirements of Vitamin D.; *but all kinds of eggs are not equally rich in Vitamin D.*

Further, symptoms of over-dosage or huge doses cause a marked increase in the calcium content of serum and deposition of calcium in the blood vessels (aorta, coronaries) kidneys and lungs; produces profuse sweating, polyuria, loss of weight, vomitting, headache and extreme lassitude. On the other hand, there is a possibility that the adverse symptoms were due to toxisterol, a substance which appears in calciferol, if the ergosterol is over-irradiated. Calculi may form in the bladder, atrophy of the spleen and thymus may also occur. There is no reason to fear such effects from ordinary doses. Mild symptoms of intoxication due to excess of irradiated ergosterol have been reported in children; the first effect produced is loss of appetite.

Cereals, if they form a high proportion of the diet, have a deleterious influence on the calcification of teeth, but Vitamin D. counteracts this defect. Recent work has shown that 1 large dose (250,000 units) will cure rickets, and 150,000 Units given daily for two months will cure lupus vulgaris; further experiments are awaited, but the expected adverse effects have not occurred, and perhaps there is a hope that this massive dosage may cure other forms of tuberculosis.

Vitamin D. is useful in all diseases listed under the paragraph *"Shortage of Vitamin D. Causes"*, and improves infantile tetany, hay fever, arthritis and psoriasis; heals fractures. "As Vitamin D. is essential for the formation of strong bones and teeth in the growing child, and as its distribution in food is very limited and uncertain, it is advisable, in many cases of pregnancy, to give daily two teaspoonfuls of Cod Liver Oil or its equivalent in Halibut or Shark Oil,"— ('For Ante-Natal Care' by a Lady Doctor in "Kanara Saraswath", Diwali Number, Octr.-Nov. 1942, joint issue, pages 260-263).

Often the cheapest and easiest way of supplying Vitamin D. is by the exposure of the body to Sunlight. A good supply of Vitamin D. during pregnancy benefits the mother and helps to ensure the satisfactory future development of the child. The growing child, the pregnant woman and the nursing mother require an adequate supply of Vitamin D. If this is deficient, the bones of the child are badly formed, resulting in rickets and dental carries, and in a pregnant woman osteo-

malacia and its consequences, viz., deformity of the limbs, the spine, the chest and the pelvis. Administration of Vitamin D. has both preventive and curative effects.

"Mustard oil, gingelly oil, linseed oil and olive oil do not originally contain Vitamin D.; but, if these oils are exposed in shalow vessels to Sunshine, Vitamin D. is produced in the oils. All foodstuffs, which during their preparation are dried in direct Sun's rays also contain Vitamin D. If oxygen is passed through heated Cod Liver Oil, the Vitamin A. content of it is destroyed and loses the growth-promoting property, but continues to be antirachitic. This antirachitic substance of Cod Liver Oil was designated Vitamin D. It was subsequently found that other vegetable oils when subjected to irradiation, develop antirachitic properties. These oily substances contained 'sterol' bodies in minute quantities. The sterol of vegetable fats is known as phytosterol and that of animal fats is cholesterol. It is these sterol bodies that on irradiation, or on exposure to ultra-violet rays develop Vitamin D. The unit of Vitamin D. is 1 milligram of Olive Oil containing 0.025 micrograms of calciferol. The Vitamin D. contents of 100 grams of substances are:—Cod Liver Oil, 12700; Halibut Liver Oil 257,000; butter 100 to 200; Milk 10 to 100; Egg-yolk 150 to 400 units. An adult's daily requirements is from 150 to 400 units. A teaspoonful of Cod Liver Oil gives 300 units. The daily requirement of the growing child and of the pregnant or lactating woman is believed to be 500 I. Units (=12.5 microgram of calciferol)".

Some 10 antirachitic Substances have been obtained by ultra-violet irradiation of sterol precursors, but only two have been isolated from natural sources. Of these, *Calciferol* ($D_2$.) is usually prepared artificially from ergosterol; the other $D_3$., appears to be the commonest natural Vitamin. They are white crystalline substances.

**Vitamin E.:**—Another Vitamin which is responsible for animal and human fecundity, i.e., a nourisher of the reproductive system, has been christened, anti-sterility or anti-destrophic, oil-soluble and fat-soluble E. (alpha-beta or Gamma Tocopherol) by its discoverers, Profs. **Herbert Evans** and George Burr. When other Vitamins are vitally important for the growth and welfare of animal organism, Vitamin E. is solely responsible for the very existence of the organism itself. The animal—male or female, from whose dietary it is lacking or altogether absent, appears to be absolutely sterile, or unable to reproduce, causing premature death of the foetus in the mother's womb and being resorbed. In the males of

the same species, complete deprivation of the Vitamin E. ultimately produces degenerative changes and permanent sterility or the offspring is weak, when there is a lack of this Vitamin, there is failure on the part of the body to utilise iron, and anaemia results. Good results have been claimed from the therapeutic use of this Vitamin (Tocopherol), in cases of habitual abortion. Three closely related tocopherols are known; the most active of these, is $\alpha$-tocopherol).

**Source and Character:**—Vitamin E. can be extracted by fat-solvents, like light petroleum, ether, absolute alcohol, benzine etc. It withstands heat to a remarkable extent and in that respect resembles Vitamin A. But under certain conditions it is susceptible to oxidation. It is found in abundance in the organs of certain plants, embryos of seeds, rice-germs, and green leaves of vegetables, chiefly lettuce, seeds, cotton-seeds and cotton-seed oils, cereals, maize peas, oats, corns, wheat-germs (germinated wheat), and wheat-germ oil. It has been isolated in a crystalline form under the name of Tocopherol, having the formula of $C_{29} H_{50} O_2$. It is a complex alcohol having a benzine ring. (Dr. H. V. Savanur's "A Handbook of Ayurvedic Materia Medica, etc., Vol. I.). Vitamin E. is relatively non-toxic.

If offsprings are to be born to perpetuate the race, the aid of this Vitamin must be invoked. An animal rendered sterile for an indefinite period by a special diet free from Vitamin E. may have fertility restored, when fed with this Vitamin either in regular food-stuffs that contain it or as an extract. Fortunately, for the perpetuation of human-beings, the anti-sterility Vitamin is widely distributed among animals and vegetable food-stuffs, and it is seldom that there is shortage of this Vitamin in the diet. It is of interest to note, however, that its distribution is quite different from that of the "Growth Vitamin", known as Fat-soluble A. Milk-fat, e.g. though rich in Vitamin A., is poor in Vitamin E. Though Cod Liver Oil is high in Vitamins A. and D., Vitamin E. is notably lacking or is NOT present in Cod Liver Oil. Throughout the life of animals, 9% by weight of the ration may be constituted by Cod Liver Oil, a single drop of which daily, is adequate for A. requirements, and yet sterility results.

**Chemistry of Vitamin E.:**—"In animal tissues in general (but not in Cod Liver Oil), the Vitamin is present, but never highly concentrated. When the non-seponifiable fraction of wheat-germ oil is removed, there remains a fraction having the characteristic physiological action of Vitamin E. From this fraction, $\alpha$-tocopherol, a compound having marked

Vitamin E. activity, has been isolated. Beta-tocopherol and Gamma-tocopherol have also biological activity of Vitamin E., but in lesser degree."

*Heat or drying or any processes of cooking, of the leaves, does not impair the activity of this Vitamin.* Moreover "In the cases of both wheat-germ and lettuce leaf, (which are very rich sources), ether extraction of the desiccated substances remove E. quantitatively and secures for us oils which are efficacious in daily single drop (25 Mg.) administration. E. is probably present in most commercial oils, so that when the latter constitute a high proportion of the diet, fertility results. Such results have been secured with Wesson Oil, Coconut Oil and Olive Oil." Oils in their natural state have a less concentrated E. content than wheat-germ, but alcoholic extracts of a hydrogenated product of cotton-seed oil may be fairly rich in the Vitamin. Exceedingly concentrated extracts may be made from wheat-germs, a single dose of 5 milligrams—1/5 (one-fifth) of a drop either with the food or administered hypodermically sufficing to restore fertility."—(Popular Science Siftings). Vitamin E., is now available either in the form of concentrates from wheat-germ oil, or as a synthetic product. *Vitamin E. has been synthesized and is known as a-tocopherol.* "It is still doubted whether Vitamin E. has real influence over the reproductive capacity of human-beings, *particularly males.*"

**Daily requirements:**—A suitable daily human dose is an amount equivalent in biological activity to 13 Mgm. of tocopherol is Acetas (B.P.C.) but sufficient is supplied in a normal diet under ordinary circumstances.

**Therapeutic dose to be added to the normal diet:**—In normal pregnancy, 3 milligrams daily. When there is history of abortion, 12 to 24 milligrams daily.

**Shortage of Vitamin E. Causes:**—Abortion, steriliy, Toxaemia of pregnancy.

**Administration** is said to "have benefited cases of dysmenorrhoea; premature labour; certain cases of toxaemia of pregnancy; sterility in either sex; deficient lactation; muscular dystrophy if given for long periods, but many of these cases have spontaneous remissions"; neuro-muscular diseases; amystrophic lateral sclerosis; bulbar paralysis and tabes dorealis. Wheat-germ oil, which is rich in Vitamin E. has been found to cure some cases of habitual miscarriage in women.

**Vitamin F.** aids growth and is found in liver and lettuce; It is the same as Vitamin $B_1$., and is comprised of highly unsaturated fatty acids (combination of linolic or arachibonic, linoleic, and linolenic), which are essential for the growth of yeast cells, and is required in small amounts, possibly to aid in the absorption of ordinary fatty acids. "It is not clear whether it is a pure compound or a mixture of compounds including thiamin, biotin, etc., which also have this property. Linoleic and linolenic acids are present in large quantities in vegetable and seed fats though not in margarine, but the presence of arachidonic acid is doubtful. This Vitamin is said to be included in the preparations of face creams, etc." "Deficiencies of Vitamin F. produce 'fat-deficiency disease' due to deficiency of the essential unsaturated fatty acids characterised by retarded and ultimately arrested growth accompanied by a raised metabolic rate, altered fat and water metabolism, changes in the skin and hair, renal degeneration and impairment of the sexual functions."—(A Treatise on Tropical Therapeutics,—1950).

**Vitamin G.**:—also called $B_2$) was also applied to niacin amide, but now it is synonymous with Riboflavin, contained in fresh milk, liver, meat, green vegetables, bananas and yeast; prevents skin disease called pellagra.

**Vitamin H.**:—or co-enzyme R., is biotin, bios II B., is water-soluble; is shown to be a cyclic urea compound containing sulphur with carboxyl group. It occurs in high concentration in tumours.

*Biotin* is found in food-stuffs containing other members of the Vitamin B. Complex, particularly yeast, liver, kidney, light chicken-meat, eggs, and peas, cocoa and cereals.

"*Biotin* is necessary for the growth of many bacterias and moulds e.g., staphylococcus, strains of clostridium, yeast and fungi. It is also a growth hormone for higher plants and a growth factor for the rat and most animals. If rats are given purified diets containing sulphaquinidine or succinyl sulphateniazol, which are bacteriostatic, signs and symptoms of biotin deficiency are produced, the effect being presumably due to interference with the bacterial synthesis of biotin in the intestines."

"Deficiency of Biotin in man is characterised by exfoliative dermatitis, greyish pallor of the skin, atrophy of the lingual papillae, disturbed erythropoiesis and spasticity. Essential for normal growth of yeast, and protecting rats or chicks against a nutritional injury caused by eating excess of raw egg-white.

**Vitamin K. or Phylloquinone or coagulation Vitamin K.**—(Because it enables the blood to clot):—This is a fat-soluble yellow oil first found in the liver-oil,—a thermostable substance abundant in animal liver-fat, putrefying extracts of fish-meal, egg-yolk, vegetable fat, rice-bran or casein; tomatoes, and green leaves and leaf vegetables, especially spinach, cauliflower, cabbage, lettuce, orange peel, strawberry, soya-beans, alfalfa-grass and germinating (sprouting) oats, probably formed also in intestinal canal of man by natural bacterial flora. "Naturally occurring Vitamin K. is non-toxic, but *menadione* in doses of 180 mg. is reported to cause vomiting porphyrinuria and transient albuminuria." "Normally, Vitamin K. is present in the ordinary articles of diet in sufficient quantities to ensure that every adult carries a normal amount. But in the new born baby it may be absent or deficient and this would be dangerous to life. To overcome this potential cause of infant mortality, two therapeutic equivalents of Vitamin K. have been discovered. One is ethylphytylnapthaquinone and other nepthaquinone derivatives, which can be synthesized to replace it. But, chief medicinal supply is synthetic. • K. takes its name from coagulation of blood. It is probably an essential group in the prothrombin molecule for the formation of prothrombin, by the liver. Bacterial synthesis of Vitamin K. occurs in the intestine.

"Goodman and Gilman have described the blood-clotting phenomenon as the summation of interaction between prothrombin, Thromboplastin and Calcium producing Thrombin; this together with fibrinogen produces fibrin. Deficiency in one or more of these factors produces an abnormality in blood-clotting. It is noteworthy that human blood may be severely deficient in prothrombin and still exhibit a normal or only slightly subnormal clotting time. Severe deficiencies of prothrombin, of course, produce great prolongation of the clotting time. It has been found that the haemorrhagic diathesis in jaundice is almost always associated with lowered blood prothrombin." —("Pharmacology and Therapeutics" by Dr. M. A. Kamath).

This Vitamin is associated with the normal functioning of liver and also with normal clotting of blood, and is essential for the normal synthesis of prothrombin in the body. Vitamin K. raises the prothrombin content to normal within 24 to 48 hours. *If given orally, in cases of jaundice, 5 grains of bile-salts should also be given; otherwise this fat-soluble factor is not absorbed.* To secure prompt action, it should be given by intramuscular injection in doses of 5 to 10 Mg., in 0.5% solution of arachis oil. It has also been found useful for minimising post-operative bleeding in cases of jaundice, and

for preventing and treating haemorrhagic diseases of the new-born.

Acito-menaphthonum is a preparation, which is given orally in tablets to expectant mothers during a week before labour. This dose is 1/6 to 1 grain.

**Vitamin K.:**—is not stored in any appreciable quantities in the body. What little is stored is held in the liver. Injury to liver may cause deficiency of Vitamin K. and reduce the clotting quality of blood. In haemophilia, prothrombin content is normal although the clotting time is greatly prolonged, and Vitamin K. is of no value in haemophilia, purpura, and intrinsic diseases of the blood-forming organs or as a non-specific haemostatic. Obstructive jaundice lowers the prothrombin of blood and patients undergoing surgical operation may die of haemorrhage. In such cases, the use of Vitamin K. does good. Infants disposed to haemorrhage show improved quality of blood on treatment with Vitamin K. Two active substances have been isolated.

**Vitamin $K_1$.:**—generally used under the name Menaphthonum (Kapilon), (alpha-phylloquinone) is 3-phyty 1-2 methyl-1.4-naphthoquinone, found most abundantly in the green leaves of plants and alfalfa grass, is a light yellow oil which crystallises on cooling in acetone or alcohol solution. It is probably the most active, though there are several varieties, all with similar action. But, methyl-naphthoquinone a synthetic equivalent with a slightly different formula, is easier to make, so is the one chiefly used. "It has been synthesised also as a derivative of nephthaquinone". Vitamin K. is not absorbed from the intestines, in the absence of bile-acids. *Therefore, when given orally, it is desirable to give bile-salts along with this Vitamin.* Curiously enough a similar and almost equally effective variety occurs in the bodies of tubercle bacilli; it has also been synthesized as menaphthonum.

Menaphthonum is insoluble in water, but slightly soluble in alcohol. It is destroyed by exposure to light. It is given in doses of 1/12 to 1/6 grain (5 to 10 Mg.) The synthetic product 2-Methyl-1 : 4-naphthoquinone is generally used in practice and is given intra muscularly.

**Daily dietary requirements:**—Unknown.

TherapeuticDose:—Adults 100 to 200 milligrams daily; babies 5 to 10 mg.

**Vitamin $K_2$.:**—is a 3-difarnesyl-2-methyl-1.4 nephthaquinone, formed by putrefactive bacteria in putrefied fish-meal, a

light yellow crystalline solid. Active analogues — all derivatives of 2-methy-1.4-nephthoquinone, — (some water-soluble) have been synthesized and used therapeutically in various conditions involving delayed blood clotting.

**Menaphthone B. P. (Menadione, Vitamin K. analogue)**— it is methyl-nephthaquinone derivative. It is a yellow powder and is sold under the proprietary name of kapilon and prokyavit in ampoules containing 5 mgm. dissolved in 1 ccm. of oil. It should be given intramuscularly to ensure absorption: oral administration is unreliable, *but if given orally, it should be combined with 2 to 3 gm. of bile salt.* The absorption of 5 mgm. produces a prolongation of clotting time.

It is useful in haemorrhagic states of the new-born. In surgical operations and cases of the obstructional jaundice of long duration, where there is tendency to bleeding, one injection before operation may raise the clotting time to normal. In haemophilia, it is of no value but the administration of oestrogen, natural or synthetic, may check the bleeding. Haemorrhagic disease of infants may be prevented by giving Vitamin K. to mother just before delivery in doses of 1 mgm. daily.

**Deficiency of Vitamin K. causes:**—Delay in the clotting time of blood and subcutaneous and intramuscular haemorrhage. Synthesis of prothrombin not properly carried out by liver, so there is a tendency to haemorrhage in the new-born and in cases of jaundice.

"Vitamin K. deficiency, which is detected by a lowering of the blood prothrombin level (hypoprothrombinaemia) may occur in any of the following circumstances:—(1) *Inadequate supply of Vitamin K.*:—(a) Nutritional deficiencies of Vitamin K.; (b) Conditioned deficiency of Vitamin K. as produced by sulphaguanidine, succinyl sulphathiazole, etc.; (c) Idiopathic hypoprothrombinaemia; (2) *Inadequate intestinal absorption* due to lack of bile in the intestine as in jaundice and intestinal obstruction, pancreatic insufficiency, etc.; (3) *Injury to the lung;* (4) *Infection particularly of the respiratory tract;* (5) *Haemorrhage.*

Indications for the therapeutic use of Vitamin K. are:— (a) Neonatal haemorrhage in which Vitamin K. substances are administered to the mother prior to delivery. The administration of compounds possessing Vitamin K. activity will exert no effect on haemorrhage occurring at the time of delivery, but they appear definitely to decrease the amount of haemorrhage that may occur secondarily following delivery.

In other words administration of Vitamin K. daily to mothers for a week, before labour increases the prothrombin content in the blood of the new-born infants, which may also receive 2 mg. soon after birth as a prophylactic against haemorrhagic disease of the new-born. (b) Obstructive jaundice.—the bleeding tendency that develops in this condition, usually prior to surgery of biliary structures is an indication for Vitamin K. therapy; i.e., haemorrhage associated with obstructive jaundice; (c) Haemorrhagic states associated with ulcerative colitis, sprue and coeliac disease are affected specifically by Vitamin K.; (d) Cirrhosis of the liver, hepatic atrophy, and ascites, are nonsurgical forms of hepatic diseases, which are accompanied by hypoprothrombinaemia; (e) Pulmonary tuberculosis—as an aid in preventing haemorrhage."—(A Treatise on Tropical Therapeutics).

**Vitamin $L_1$. and $L_2$.**:—Factors $L_1$. and $L_2$. claimed to be essential for the lactation in young rats, are stated to be present in beef-liver extract and yeast respectively. It has been suggested that these factors may be identical with the liver filtrate factor of Morgan and Simms or some other factor present in the "filtrate factor". The existence of these factors has not been confirmed.

**Vitamin M. (Folic Acid)**:—This Vitamin is identical with Folic Acid, and is present in yeast and crude liver extract. Deficiency of this causes a pellagrous syndrome of anaemia, leuco-cytopoenia, diarrhoea and mouth lesions in monkeys, on account of lowered resistance of intestinal mucous to infection by B. dysenteriae.

N.B.: ("Vitamin M. is different from the well-known members of the Vitamin B. (complex) such as pantothenic acid, choline, para-amino benzoic acid, pyridoxine and inositol)". "These, monkeys also responded to highly-purified lacto-bacillus casei factor."

**"Factor U."**:—A water-soluble growth factor of chicks; it occurs in yeast, wheat-bran, and corn. This may be identical with Vitamin Bc.

Rice Polish Factor:—A factor, recently discovered, is essential for the growth and maintenance of animals receiving all other known Vitamins, or factors. It is present in rice-polishing and has been suggested to be complimentary to Vitamin $B_6$. in preventing rat dermatitis. This really may be a complex, as it can be replaced by a mixture of glycine and glycuronic acid or certain pentoses.

Vitamin P. (Rutin, Hesperidin Methyl Chalcone) or

citrin occurring naturally in lemon juice, is water-soluble: always found in association with and closely related to Vitamin C.; possibly related to the (yellow) flavanone, hesperidin, chalcone, an unstable body, which can be stabilised and made water-soluble by methylation; and believed to be concerned in controlling the number of haemorrhages, occurring in the course of certain conditions by the resistance of the capillary walls to the application of pressure. Citrin was later found to consist of mixed crystals of two different flavone glucosides: one hesperidin (m.p. 261°) forming the major part, and the other an eriodictol or eriodictyol glucoside to which the activity of citrin was attributed. Recently R.H. Higby investigated crude preparations of the flavanone constituents of citrus peel, including orange hesperidin, lemon citrin and lemon eriodictin, all of which were found to contain, in varying proportions, both the blood pressure reducing factor and the capillary permeability factor. Hesperidin has been administered to patients whose capillary tonus was decreased in vascular haemorrhagic diseases as a result of trauma, pressure, avitaminosis, bacterial invasion, chemical injury or lymphatic infiltration. A large measure of success was attained where the purpura was allergic, infective, or nutritional, *but not where it was mechanical.* (I. N. Kugelmass, J. Amer., Med. Ass. i/1940. 519).

Experiments suggest that it prevents or controls capillary fragility and controls or maintains normal permeability; so is active against scurvy and purpura; a further property of great importance, if it is confirmed, is that it appears to reduce blood pressure. A deficiency of Vitamin P. may exist in man even when he has been taking large doses of ascorbic acid for long periods. Its clinical manifestations include pains in the legs on exertion and pains across the shoulders, weakness, lassitude and easy fatigue, with a reduced capillary resistance, characterised by the development of spontaneous petechial haemorrhages in areas of skin subject to pressure. It responds to treatment with Vitamin P. Purpura haemorrhagia after arsenic therapy was successfully treated with Vitamin P. The erythema and dermatitis occurring as toxic manifestations of anti-syphilitic therapy are shown to be associated with a low capillary resistance and clinical improvement follows the use of Vitamin P.

Vitamin P., like Vitamin C., appears to be readily destroyed by oxidising agents and is unstable in alkaline solution.

Vitamin P. is present in paprika (a variety of Capsicum annuum grown all over Europe), chillies, pimentos, oranges,

lemon peel and juice (citrus fruits), black currants, tomatoes, green vegetables, in extracts of Hungarian red-pepper, grapes, plums, prunes, and a purry made of rose-hips: 'Paprika' contains about 4 or 5 times as much Vitamin C. as lemon.

A water-soluble concentrate prepared from black-currants was 100 times as active as re-crystallised Hesperidin.

*Exact requirements and therapeutic dosage are said to be unknown so far.* Yet, "Hesperidin in daily doses of 1/4 to 1 gram orally, or 10 to 15 mg. intramuscularly is at present on trial in the treatment of purpuras, particularly those of anaphylactoid, dietatic and arsenical types." "Recently considerable question has been raised as to whether or not Vitamin P. has any physiological or pharmacological effect in humans. Considerable data suggests it has none."


| For Appendices. | BOOKS AND PERIODICALS CONSULTED FOR APPENDICES IV & V. |
|---|---|
| IV | 1. Home & Village Doctor (1945) by Satish Chandra Das Gupta. |
| V | 2. Extra Pharmacopoeia (1943) Vol. II by Martindale. |
| IV | 3. Nutritive Value of Indian Foods & the Planning of Satisfactory Diets. (Health Bulletin No. 23 (1937) by W. R. AyKroyd., of Government of India). |
| IV & V | 4. O'Meara's Medical Guide and Book of Prescriptions (1924). |
| | 4 (a) O'Meara's Medical Guide and Book of Prescriptions for India & the Tropics (1947). |
| IV | 5. Pocket Book of Vegetable Gardening, (1942) by C. H. Nissley. |
| IV | 6. Famous Book of Herbs by Heath & Heather, Ltd., London. |
| IV | 7. Pharmaceutical Pocket Book (1944). |
| IV | 8. New Pocket Quiz Book, (1945) by Slifer & Crittenden. |
| IV & V | 9. "Hind Fisherman", October 1951, Page 12. |
| IV | 10. Library of Health, Vol. V—Science in the Kitchen, by Mrs. E. E. Kellogg. |

IV 11. Better Homes, (1947) by M. A. Needham & A. G. Strong.

IV 12. Teddington Chemical Factory Ltd., Bombay, —Diary for 1951.

IV 13. Kaufmann on Disease (booklet) pub.—A. P. Ordway & Co., Manufacturing Chemists, New York, N.Y.

IV 14. Home Science (1930) by Wyskoff & Marshall.

V 15. Three Ways to Health (1941) by H. C. Menkel.

V 16. Chambers' Technical Dictionary (1949).

IV & V 17. "Health & Happiness" monthly of Calcutta:—February 1933, page 26 (V); May 1933 page 117 (V); June 1933, page 140 (IV); Oct. 1933 page 218 (V); April 1934, page 89 (V); October 1934, page 238 (IV); December 1934, pages 282 to 287 (V); November 1935, pages 268 to 269 (V); December 1938, pages 298 to 299 (IV & V); January 1939, page 21 (IV & V); July 1939, page 154 (IV).

V 18. Hand Book of Medical Management, (1951) by M. Chatton & others.

## APPENDIX VI.

Principal Forms of Ayurvedic Medication and Methods of their Preparation and uses in brief:—

"Ayurvedic Vegetable Materia Medica includes not only crude drugs proper, but also a large number of preparations made from them:—e.g., as given in this Appendix."

"As different parts of plants contain different properties, only those parts which contain efficient properties are used in the below-mentioned forms of preparation. Whole plants are used in the case of herbs which are very small and possess one uniform Rasa ( रस ) in all their parts. Each variety of preparation has its own value in therapeutics. The *Churnas* are rather bulky preparations and on account of their complex nature take more time to act. It is, therefore, desirable that only those drugs whose principles are easily soluble or separable should be chosen in the preparation of *Churnas*. Sugar, common salt, rock salt, etc., are generally mixed with these powders in order to make them more active and palatable. Water, milk, honey and ghee are some of the

common vehicles. In some cases, the juices of fruits like the lemon or pomegranate are used, as the organic acids, which they contain, facilitate the action of the *Churnas*. Before using the powders of the whole drugs, it is therefore necessary to ascertain which drugs are water-soluble and which are not. In modern Pharmacopoeia, alcohol, ether and the like are used as solvents to help the easy solution of the constituents, which are insoluble in water. (Tinctures are instances of such processes). This is because modern Pharmacologists are in favour of availing themselves of the important constituents only and not all the parts of the drugs. Ayurvedists, on the other hand, have attached more importance to the clinical findings and have based the pharmacological value of the whole drugs on the results of experience. In the place of tinctures, they have used decoctions and infusions. They have again used extracts occasionally, evidently for the purpose of portability and adaptability and also for the facility of concentration, which they afford. Similarly methods of maceration, percolation and precipitation have been used to separate the soluble from the insoluble constituents of the drugs. *Satvas* ( सत्व ) are instances of such preparations.

Whole drugs were used by the Ayurvedists of the olden times for reasons not only pharmacological and economical but also social i.e. relating to the tastes, habits, customs and social conditions, obtaining then in the country. It must be admitted that strides of civilisation have always something to do with the turn of mind of particular generations: yet we cannot ignore the fact that the system had grown in India on account of both extraneous circumstances and intrinsic virtues. So far as the scientific methods are concerned, it may be said that the ( पांच भौतिक ) *Panchabhautika* character of *dravyas* ( द्रव्याण ) prominently occupied the minds of the Ayurvedists, and not the analytic and synthetic methods of the West, as the latter, though practical could not satisfy the basic theories of the Orientals. "It is the character of the Western intelligence to analyse, separate and combine," but this process is sometimes too elaborate and the results obtained are sometimes time-serving. There is also a tendency to artificialise, which makes the subject more and more complex. The motto of the West is to find out drugs or remedies, which have a specific property capable of a sure and rapid action. These tendencies, though useful in serving one purpose, are not free from the faults of commission and omission." (Dr. H.V. Savnur's—"A Handbook of Ayurvedic Materia Medica, etc." (1950).)

1. *Anjans* are remedies intended to be used in eyes for their local or general effects. To relieve pain especially in the head, *Anjans* are commonly resorted to in Ayurveda.

2, *Araks* or *Arkas* or *Arkams* are distilled essences or liquors, made by soaking drugs in water for 24 to 48 hours and then extracting their essence by distillation; the essence or liquors thus obtained are *Arkas*. *Araks* are usually equivalent to aquae or 'waters' of the British Pharmacopoeia, and they are prepared in the same way. They are used in fevers, dyspepsia and externally as cooling lotions.

3. *Aristas* (See also *Asavas*), are weak alcoholic preparations prepared by making a decoction of the drugs and then allowing them to undergo fermentation by the help of raw sugar or honeys. Fermentation is allowed to go on for a period of 7—10 days in hot weather, for 15 to 30 days in cold weather.

4. *Asavas* or *Asavam* & *Aristas* or *Aristams* (*Asavarishtas*) are medicated spirituous liquors. They are prepared with honey and treacle and various medicinal substances, such as roots, leaves, barks, etc., of plants cut into pieces and steeped in water and laid aside in air-tight earthen jars for vinous fermentation for at least six months. The proportion of the different ingredients, is generally as follows:—Water, 32 seers (or 1024 tolas), treacle or jaggery 12½ seers, (or 400 tolas), and honey 6¼ seers, (or 200 tolas), medicinal substances 1¼ seers, (or 40 tolas), in powder or decoction. When raw vegetable juices are used for fermentation, the resulting fluid or liquid is called *Asava*. In other words, *Asavas* are weak alcoholic preparations prepared by infusing the drugs, in cold water and allowing to undergo fermentation with the help of raw sugar or honey." *The above difference in Arishtas and Asavas is not true in all cases.* Some *Asavas* are prepared by decoction and some *Arishtas* from infusion."—Dr. J.R. Goyal. When the decoction of drugs only is used for fermentation, the fermented product is called *Arishta*. These preparations combine the virtues or properties of spirituous drinks and those of the drugs used in preparing them. Many of these are stomachics, stimulants, tonics, astringents, alteratives, febrifuges, etc.

5. *Avalehas* are *Lehas,* linctuses or confections or thickened extracts. These are equivalent to confections, electuaries or conserves of the B.P. To prepare them, decoction, after being strained, is again boiled down to a thick soft consistency with sugar or honey. If sugar is to be used in this preparation,

its quantity should be four times that of the drugs, and in the case of jaggery, it should be double that of the drugs. If water, or milk, or cow's urine is to be added, the quantity to be added should be four times that of the drugs used. These extracts or confections, when properly made, should sink in water, do not readily dissolve in water, can be drawn out into threads or wires, and, if made thicker, will receive impressions of coins on their surface. They should show a good colour and emit sweet smell. Extracts are generally administered with the addition of milk, sugarcane juice, sugar or any other infusions or decoctions or powders, in 4 tolas desirable under the circumstances. *Avalehas* are used for digestive troubles, respiratory affections and for general tonic effect on the body.

5 (a). *Bati*:—There are pills or tablets.

6. *Bhasmas* or *Bhasms*: (See:—*Sinduras*). These are called alkaline ashes and are prepared from vegetable and mineral substances. Vegetable ashes:—In the case of Vegetable, the drugs containing more or less alkalies are at first made into a coarse powder or pieces, and then burnt till they are completely reduced to ashes. Mineral ashes:—In preparing these, metals are first subjected to a process of purification. The purified mass is then oxidised. The oxidised product is then subjected to a process of roasting. Finally, the roasted mass is reduced to a fine powder, when it is fit for use. Ashes are also prepared from various animal products, such as, hart's horn, pearls, cowries, etc.

6 (a). *Bhasms* or *Bhasmas* (Ashes)—are also usually oxides of metals (reduced metals) intended for internal use. In Ayurveda great emphasis is laid on the way a *Bhasm* is prepared. An oxide prepared in slightly different way, though chemically identical, is said to possess different properties. Crude metals, such as gold, silver, copper, etc., are first purified in vegetable oils and juices of different plants. They are then roasted, oxidised and finally reduced to such a degree, that these reduced particles actually float on the water, and this is the usual test in Ayurveda to see that the *Bhasmas* become *Varitara* ("floating on water"). This test, though seems very ordinary, has very great importance from the medication point of view. *Bhasmas* of such test are easily assimilated in the general system and they directly increase the metabolism and have a definite action upon the endocrine glands. This is the observation of M/s. D.K. Sandu Bros.' Pharmaceutical Works, Chembur, Bombay, in their own practice. They add that the chemical analysis of the *Bhasmas*, manufactured by them, does not give very satisfactory results

and that will help them to standardise their preparations from the therapeutical point of view; in spite of the fact, they say, that they cannot ignore the marvellous results, obtained, and hence they are strictly following the process laid down by the *Shastras*.

N. B.:—"As fresh or preserved medicinal plants, or their juices or their liquid extracts, could not be had ready at hand at all times and in all places, **Bhasmas**, furnish a permanent and equally (or even more) effective medicament, ready-made and available everywhere. Scondly, the process involves physico-chemical action of various medicinal herbs on different metals or other inorganic substances, thus transferring the properties of the former to those substances, and making them more easily assimilable. In this way, a particular metal is not only rendered innocuous, but it can be easily absorbed in the human system, consequently having optimum effect with minimum dosage. The various Bhasmas are either **Satwas** ,i.e., activated principles, or Salts, i.e. organic chemical compounds. **Praval mauktik**, etc., belong to the first group; while Tamra, Jasad, Nag, etc., comprise the second variety. There is another method, which involves interaction of inorganic substances, viz., **Nag** and **Mansheel, Vanga** and **Hartal**, etc. Though this method is more economical as regards time and money, and **Bhasmas** prepared accordingly are more powerful in action, **yet they are less tolerable to the human system and may show toxic symptoms.** Thus, the main object underlying this process, viz., to activate inorganic substances, is better achieved by the first method, i.e., physico-chemical action of different medicinal herbs. In spite of the fact that it is more elaborate, laborious and expensive, it is the only method of choice on reasonable and scientific grounds, as it combines therapeutic properties of both the groups and provides us with preparations easily assimilable and heightened in their therapeutic standard.

A few points of practical importance require special mention as regards the preparation of this category—

1. No preparation of this group is regarded fit for internal administration unless it is **Niruttha** i.e., it forms a stable compound with the herb-products used as reagents; otherwise its molecules may dissociate to reform the original metal and thus may show untoward symptoms. It is therefore, of paramount importance to see that the preparations must be genuine and stand the rigid scientific tests; and then they must come only from reliable manufacturers.

2. All preparations of metals, i.e., **Bhasmas**, have a common earthy taste (though not metallic on any account), but they vary in colour according to the method of choice.

3. As a general rule, the older the preparation the more efficacious and innocuous it becomes.

4. These preparations should always be stored in glass-stoppered bottles.

5. One Bhasma given in combination with different vehicles and under different pathological aspects shows minor shades of variation in its therapeutic action.

6. Some preparations of this group are very strong in nature and as such they should be used with due caution. **Haratal Bhasma is the strongest, and Tamra, Loha, Mandoor, Makshika, Abhrak, Praval,** etc., follow in descending order.

7. *Bhavana* is a process in which powders are soaked in various fluids, such as the expressed juice of herbs, decoctions etc., and then dried. For this purpose the quantity of juice added to the powder should be sufficient to cover it. The mixture is then allowed to dry in a shaded place. This process is repeated twice, thrice or as many times, as is necessary.

8. *Choornas* or *Churnas* or *Churnams* are powder-mixtures prepared by pounding dry mineral, animal or vegetable substances in a mortar with a pestle and passing the powder through cloth or linen, or fine sieve. "If jaggery is to be mixed with the powder, it should be equal to the *Churna* and in the case of sugar, it should be double the *Churna*. If asafoetida is to be mixed, it should always be baked over fire to prevent nausea. Usually powders are taken with milk or hot water, or cow's urine, etc., and are often used four times in quantity. Sometimes with ghee, oil, honey or sugar, their proportion is just sufficient to mix the dose, or even double the *Churna* in quantity. Where no directions are given, hot water is the only *'Anupan'* or vehicle. *Churnas prepared without the aid of machinery are considered more effective.* *Choornas* (Powders) are particularly useful in later stages of severe maladies after the well-known *Bhasmas* and *Rasayanas,* are used and the morbid process has been brought to the minimum. These are required to be given in bulk, and their action, though quick, is only temporary. These are the least toxic and dangerous, and their efficacy depends on timing their administration in relation to the disease and the hour of the day, meals, etc.

9. *Dhuni* or fumigations are local applications consisting of various incenses and of pungent vegetable, animal or mineral substances. They are capable of being volatilised by heat, and the vapour which escapes, may be directed towards a limited part, such as the head, face or anus, or widely diffused over the skin of the whole body.

10. *Dhupana* is a process used for patients; it is as follows:—The patient is made to lie on his back in a sleeping posture, in a cane chair, or on a couch, all his clothes having been previously removed. He is then covered over with a blanket. Incenses or other drugs are sprinkled over burning coals kept in an iron or copper plate. The fire (with burning drugs) is put under the chair or couch, and the fumes directed to the naked body.

11. *Dravakas* or *Dravakams* or *Dravas* or distilled mineral acids,—several formulae are given in different works for their

preparation. A number of mineral substances or salts are heated in a retort and the distilled fluid collected in a glass receiver. The acids are tested and regarded as well-made by their property of dissolving a *cowrie* or shell thrown into them. There are two varieties of *Dravaka,* called *Swalpa-Dravaka* and *Shanka-Dravaka.*

12. *Faanta* (See: *Phantas*), is infusion prepared in hot water by steeping (for 12 hours) in an earthen vessel, pounded drugs 1 part, in 4 or 8 parts of fresh boiled water, till it becomes cold. The fluid decanted from this vessel after the stated period is called *"phanta"*. It should be used in the same way as decoction. The dose is 8 tolas.

13. *Gandha-pakas:*—(See:—*Tailapaka* paragraph).

14. *Ghritas* or *Ghrithams* or *Ghritapakas,* are preparations of medicated ghees (*Ghritas*) or clarified butter. The *Ghrita* or clarified butter is first of all heated on a fire so as to deprive it of any water that may be mixed with it. A little turmeric juice is then added to purify it. *Ghrita* thus purified is placed on a fire in an earthen, copper or iron pan and melted with a gentle heat. Then the medicinal paste (*kalka*) and fluids to be used, are added, and the whole boiled together till the watery portion is all evaporated and the *ghrita* is free from the froth. It is then strained through cloth and preserved for use. *Ghrita* thus prepared should be imbued with the colour, taste and odour of the medicines with which it has been boiled. The preparation of *ghrita* by boiling is not completed in one day; the medicines are allowed to remain in contact with the butter for sometime, so that their active principles may be thoroughly extracted. The usual proportion of the ingredients is this:—Vegetable drugs in paste, is 1 part to 4 parts of clarified butter, or ghee, and 16 parts of water. When liquids thicker than water, such as decoctions or expressed juices are used, the proportion of the solids or the paste is 1/6 or even 1/8 of the clarified butter. The boiling process is carried on to three degrees, called respectively, *mridu* or mild, *madhyama* or the intermediate, and *khara* meaning hard or overdone. In the first, the boiled paste is soft; is suitable for use as snuff; in the second, it is just soft enough to be made into pills with the fingers. In the third form, it is turned hard and dry. The intermediate form is preferred for internal administration and injection into the rectum, while the over-boiled form is used for external application. The under-boiled form is said to be suitable for use as errhines.

*Ghritas* are also prepared by mixing the powdered drugs in ghee (preferably cow's) which should be at least of 1 year old; sometimes the mixture is boiled with water or milk, or the decoctions of the expressed juices, of vegetable drugs or powder, for some time, so that the active ingredients of the drugs go in solution in ghee and then it is filtered hot through a piece of muslin. The filtered ghee is used both internally or externally as required. Though ghee in itself has very useful properties, *ghritapakas,* i.e., ghees impregnated with efficacious and active herbs, are usefully prescribed to emaciated and run-down patients, with very low appetite and digestion, dry skin, constipated bowels, mentally worried and tired of drugging. *Ghritas* are to be taken only with meals and hence satisfy a worried patient, that he is not unnecessarily drugged. *Ghritas* should be preserved in glass-stoppered bottles to protect them from deteriorating.

15. *Gudikas* or *Gulikas* (Pills):—(See also *Vatikas*—Tablets), are large pills or boluses. The method of preparation is just the same as in the case of '*Vatikas*' or 'Vataka'. These are intended to be swallowed whole by chewing or without. These including *Guggulu,* are very much milder than the *Bhasmas* and *Rasayanas,* with a very few exceptions. These are, as a general rule, less durable and deteriorate on exposure to the atmosphere, and hence require to be kept well-protected. These are useful to the run-down and weak patients suffering from chronic complaints and sensitive to any medicament hot in nature. Similarly these are required to be continued for days together, as action on the systematic tissues is very slow and mild in nature. But they have one very great advantage, viz., they can be administered to children and the aged, and during pregnancy, where *Bhasmas* and *Rasayanas* cannot be tolerated.

16. *Himams* are cold infusions prepared by steeping for one whole night 1 part of powdered drugs in 6 parts of cold water. The dose and the method of preparation are the same as in the case of '*phanta*' or '*Faanta*'.

17. *Kalkas* (pounded mass) is paste prepared by grinding dry or fresh whole vegetable substances, moistened with water, if necessary, on a flat stone or slab with a muller into thin paste, ball, or a vicious lump. When honey, ghee or oil is to be added to the mass, it should be double the quantity of the drug. But in the event of the addition of sugar or jaggery, the proportion should be equal, and when liquids are to be added, they should be four times the mass.

17(a) *Kalpas:—See "Vanaushadhi Kalpas".*

18. *Kanjika* is a sour liquid produced from the acetous fermentation of powdered paddy and other grains. Two seers of powdered paddy (grown in rainy season) are steeped in 8 seers of water and laid aside in a covered earthen pot for 15 days and upwards, so that it may undergo acetous fermentation. The resulting fluid is called *Kanjika* or *Dhanyamla,* that is, the acid produced from paddy. *Kanjika* is a clear transparent fluid with an acid taste and vinous smell. It is cooling, refrigerant, and useful as a drink in fever, burning of the body, etc. Other grains besides paddy are sometimes used for acetous fermentation. If mustard or the seeds of Raphanus sativus are used instead of paddy, the resulting fluid is called *Sintaki.* If the husked grains of barley are boiled and steeped in water, the resulting acid liquor is called *Sauvira.* When the husks of fried seeds of Phaseolus roxburghii and barley are boiled together for acetous fermentation, the acid is called *Tushamvu. Arnala* is a soul gruel made from fermentation of boiled rice.

19. *Khandapaka*—means Confections. These are made by adding to syrup, medicines in fine powder and gently stirring them over a slow fire till intimately mixed and reduced to proper consistence, i.e., that of an extract. Honey is usually subsequently added to confections.

20. *Ksharams or Ksharas* (Alkalies):—Medicinal plants or herbs, or specified parts of them, are wholly or completely burnt, and their ashes allowed to dissolve or mix in water allowed to stand, and which after filtration, is evaporated. The residue thus left is a white fine powder, which is called *Kshar,* is a very useful preparation, effectively acting on the complaints of liver and spleen. As a rule, *Ksharas* are very active, costic and corrosive, and *hence should be used with discretion and caution.* These are stimulating to digestive secretion, anti-fermentative, and useful in cases of ascites and abdominal tumours. *An overdose or indiscriminate use leads to decay* and falling of teeth, stomatitis and destruction of body tissues. *In cases of pregnant women, tuberculous patients, the aged and young children, ksharas should be prescribed very judiciously.*

21. *Kshirapaka* is decoction in milk. One part of medicine or drug is boiled in 8 parts of milk and thirty-two of water, till the water is evaporated and the milk alone remains; the decoction is then strained.

22. *Kvaths* (or *Quaths*) or *Kadhas,* or decoctions are generally prepared by boiling 1 part (½ to 2 tolas) of vegetable substances or drugs, (roots, woods, barks and leaves of fresh

plants), previously pounded into coarse powder or cut or sliced into small pieces, and then boiled over a slow fire with 8 or 16 parts of water, till the whole is reduced to one-fourth, or 1/8, or 1/16 of the total water is left. The decoction is then strained through cloth. When decoctions are prepared with dry substances, 8 parts of water are used. *Quaths* or decoctions are administered with (anupans) vehicles like salt, honey, sugar, treacle, alkalies, (alkaline ashes) ghee, oil, or some medicinal powders, as the case may require. The principal drug should be taken or mixed with the *quaths*. Every day, the decoction should be prepared fresh, in several doses for the whole day, for administration; *it should under no circumstances be kept overnight*. Always prepare fresh *Quaths*. Decoctions are of different strengths, as under:—

1. "*Paachan*"—is a decoction in which the solution is reduced to one-half of the total quantity. It digests the "*Aamadosha*".
2. "*Deepan*"—is a decoction in which the solution is reduced to one-tenth. It stimulates excretion.
3. "*Shodhana*" is that type of decoction in which the solution is reduced to one-twelfth of the total quantity. It eliminates excretion.
4. "*Shamana*" is a decoction in which the solution is reduced to one-eighth. It modifies the severity of the disease.
5. "*Tarpana*" is a decoction in which the solution is boiled till it reaches the boiling-point. In nourishes the *Dhatus*, (tissues).
6. "*Kledana*" is a decoction in which the solution is reduced to one-fourth. It causes disquietude-distress to the heart.
7. "*Vishoshee*" is also a decoction in which the solution is reduced to one-sixteenth. It causes thirst.

General instructions regarding the preparation of decoctions:—

A decoction should not be allowed to evaporate after the proper strength is reached, nor should it be boiled again after being once taken off the fire and placed on the ground.

A decoction should be rejected when (a) it assumes a dark, blue or red colour; (b) it becomes thick, slimy or weak; (c) it is over-boiled; & (d) it emits a raw or rotten fleshy smell.

The odour of the decoction should be of the nature of the drugs used, and its appearance pure or lustrous.—(A Hand-Book of Ayurvedic Materia Medica, etc., (1950)).

"Famous Ayurvedic Ltd., concerns are preparing *Quaths* in concentrated liquor form, wherein all the properties of the crude *Quaths* have been fully preserved. These liquid *Quaths*, although free from alcohol remain well-preserved for a long time. Though rather slow in action, these have penetrating properties and are very useful in chronic cases.

23. *Lepams or Lepas* are plasters prepared by mixing various resinous substances together. *Lepas* from proprietary preparations come in the form of globules, which should be rubbed, preferably with hot water (unless otherwise stated). The mode of application varies. Some put resinous substances into any hot spirit, till a kind of paste is formed. When cold, it is applied, after washing the affected parts quite clean, to the affected part, which is then covered with cotton-wool and the *Lep* is allowed to remain over the skin for 4, 5, or 7 days. Some *Lepas* are prepared by mixing powders with water, lemon juice, ghee or egg, and applied to the parts affected. Another mode of application is to mix a drug or drugs in hot or cold water, and spread it on a piece of brown paper, or muslin, is known as mustard plaster or *lep*. The previous applications should be washed away with hot water and the part dried before a fresh one is applied. *It should never be scraped dry, as it irritates the skin and causes inflammation.* A subsequent application is only made after washing the previous one; and the part is, *under no circumstances, to be fomented after the application.* It should be likewise covered with cotton-wool to prevent cracking.

24. *Malamas* (Ointments):—These are semi-solid or soft preparations acting chiefly as local anodynes and sedatives, for local application for various lesions, containing active drugs mixed with ghee, vaseline, bees-wax, cocoanut or cocum oil, etc., either alone or in combination form, the bases of all ointments. *Strict precaution should be taken to protect the eyes from these ointments as they cause irritation.* Similarly contamination of the ointment with dirty and soiled fingers should be avoided during application. The lesion where one particular ointment is intended to be applied should first be cleaned with an antiseptic lotion or soap and the part dried with clean and sterilized linen. Ointment just sufficient for one application should be taken separately and carefully applied to the part. Strict cleanliness is in itself the first essential measure towards recovery.

25. *Manda* (decoction) is prepared in 14 parts of water and one part of the cereal,—usually rice or *'Laj'*. *Manda* when ready, is completely free from the grain (rice).

25 (a). *Mantha* is also a variety of cold infusion: an emulsion prepared in an earthen vessel; of one part of drugs in fine powder with four parts of cold water. The dose is 8 tolas.

26. *Matras*:—See *Rasayanas*.

27. *Modakas* are boluses, larger than *gutikas*, prepared by adding powders of medicinal substances to cold syrup and stirring them together till uniformly mixed. *No boiling is required in this preparation.* Syrups should be made with sugar and water, or with sugar and decoction of the prescribed drugs.

28. *Murambas* (Confections) are liquid preparations of drugs or fruits made by soaking them in syrup or honey.

29. *Nasya*:—These are sternutatory preparations used in the treatment of cold, headaches or nervous diseases.

30. *Pakas* are of two kinds, liquids and solids, jelly-like soft preparations of drugs for internal use, made into a paste or solid mass with sugar, milk, or honey, to give them an agreeable, pleasant taste as well as to preserve them. The thin paste is also called *Avaleha* (linctus), and the semi-solid mass is called *Paka*.

31. *Panakams or Panakas*, are Syrups.

32. *Panchakashayas* are the extracts of some of the proximate principles of drugs in varying proportions.

33. *Paniyas* are weak forms of decoctions prepared by boiling one part of medicinal substances in 32 or 64 parts of water till the water is reduced to half the quantity. This preparation is strained and given to patients to appease thirst; and can also be given during meals.

34. *Parpatee Kalpa* preparations contain mercury sulphide as their essential constituent and are prepared in the forms of flakes with the aid of heat as the physical agent. Hence each of them is called a "*Parpatee*". These are particularly indicated when a certain *Bhasma* requires to be administered in minimal dosage and that it should be dissociated into its compounds in the intestinal tract, and thus be absorbed in the system. Any medicament can, in this way, be prepared in the form of a "*Parpatee*" by this process of chemical action of mercury sulphide. These preparations possess in common one important quality of disinfecting the elementary canal and thereby detoxicating one of the greatest sources of

morbid processes. In addition, they act as tonics and alteratives and are milder than preparations of *"Sindoor Kalpas"*. These should generally be prescribed mixed with sugar and swallowed with milk or buttermilk.

35. *Peya or Yoosha* decoction is prepared in 14 parts of water, and 1 part of the cereal, and the preparation is allowed to boil till the consistency gets thicker than that of *'Manda'*. *Peya* is a little mixed with the grain. *Yoosha* is a bit thicker than *Peya*.

36. *Phanta*: See Faanta.

37. *Praleps*:—These are preparations for external use applied as paint or poultice.

38. *Pramathya*:—1 part of the drug is first ground into a plup, and the pulp, so formed, is boiled in 8 parts of water, till the liquid is reduced to a fourth of its measure. The dose is 8 tolas.

39. *Putapaka* means roasting, or roasted mass within a closed cover. In this process, vegetable drugs are reduced to a paste which is wrapped up in the leaves of either Eugenia jambolana or Ficus Bengalensis, or Gmelina arborea, firmly tied with thread, string or fibres of some sort, preferably vegetable, covered with a layer of clay from half to one inch in thickness and roasted in or over a fire made of dried cow-dung-cakes. When the layer of clay assumes a brick-red colour on the surface, roasting is known to be complete, the ball should be withdrawn from the fire and broken-open, and the juice of the roasted drug expressed. This juice is administered, with the addition of honey, sugar or such other adjuncts, as may be directed. Sometimes the roasted drug itself is given in the form of a powder or pills. Thus, *'Putapakas'* contain some more principles of the drugs than *'Svarasas'*, owing to the action of fire. The dose is 1 to 4 tolas, and is generally recommended to be taken with milk.

40. *Quaths*: See:—*Kvaths*.

41. *Rasas* or *Rasa-Oushadhams*, are preparations of metals, containing mercury in any form. As most of these preparations contain various kinds of poisons, they are made into pills and tablets, so as to fix the proportion of dose. *Rasas* are generally taken with *Kvath*, milk or water, sometimes honey, ghee, or both are used as *anupans*, which help in swallowing the medicines with ease. As most of the *'Rasas'* contain aconite, though it is purified according to Ayurvedic processes, yet *it is safer that old persons or those who suffer from cardiac weakness and respiratory disorders, should very carefully be treated with 'Rasas' containing aconite.*

42. *Rasayanas* (*Khalvee*) are major mercurial preparatoions which form in Ayurved the chief part of the most important preparations. Every *Rasayan* contains mercury and sulphur in combination called "*Kajjali*", (or mercury in different forms, e.g., metallic, sulphide, subsulphide, black sulphate, oxide, etc.). But, a few are exceptions, as they contain no mercury, and yet they have got action similar to mercury-containing *Rasayanas*. *Rasayanas* should be stored in glass bottles to keep them active and free from atmospheric contamination. Some *Rasayanas* are also known as *Matras*. Both the constituents are first purified by an elaborate process, and also are required to be imbibed with the properties of fresh juices of different indigenous plants, whereby the preparations become more potent. Different *Bhasmas*, which form the constituents of Rasayanas are first carefully prepared fully in accordance with the formulae and process of Ayurvedic Science. These preparations retain the therapeutic properties and potency for any length of time. A skilful and experienced practitioner may find various different marvellous results when used through different *Anupanas* or Vehicles. *Rasayanas* promote different secretary organs and endocrine glands, and build up all body tissues, and for fulfilling these objects, *Rasayanas* require to be thoroughly triturated. Trituration is a process by itself, which allows effective combination of different constituents of a particular preparation and divides it into finest particles, thus increasing its assimilative power and therapeutic effect.

*Kupistha Rasayanas* or (*Sindura Kalpa Rasayanas*) differ from simple *Rasayanas*, only in one respect, viz., that they are required in addition to trituration to be heated with other suitable minerals, in hard glass, in a red hot furnace, from 24 to 72 hours. These being stronger than simple *Rasayanas*, are more effective and useful in prolonging the life of the patient in the last stage, *even when injections fail to have the desired effect! But, being very active and powerful, they demand a judicious and timely usage in medical practice. These are meant for momentary application and are contra-indicated for a prolonged usage. They should be always prescribed in combination with adjuncts and correctors, and greatest precaution should be taken to ascertain that they are genuine and prepared scientifically and correctly, so that mercury is well combined with other ingredients. Otherwise there is a great risk of mercurial poisoning.*

43. *Satvas or Satwams*:—The fresh herb is crushed into a coarse mass and allowed to remain in a basin of water for about 12 hours. The whole thing is churned vigorously and

strained through muslin. The strained fluid is allowed to stand for some hours, during which time, the active ingredients settle at the bottom. The upper column of the clear water is siphoned off and the sediment is dried into a fine powder, which contains all the properties of the respective medicinal herb in an altered form and taste. All such essences are cool in action and very handy for administration.

44. *Seedhu* is a process by which wines are produced by fermentation of raw or boiled juices of plants, or their parts.

45. *Seka* or fomentations, are direct applications either of dry heat or hot medicated steam. Dry heat may be applied with a piece of flannel heated over a fire, or by a calico containing heated salts and brick, tile, or hot ashes prepared from various vegetables. A bag made of thin flannel and filled with hot bran, *Ajamoda,* Cannabis Sativa, or Anthemis nobilis flowers, is often used for this purpose. Hot medicated steam, —Flannel, wrung out of boiling water, to which poppy heads are added, is a common mode of using moist fomentation. The skin should be carefully dried after their use, and a dry flannel should replace them. Varalians is a common term among Indians for applying heat to painful parts.

46. *Sinduras:*—See:—Bhasmas.

47. *Sitakashaya* is cold infusion prepared by steeping one part of the powdered drug in 6 of cold water for the night and straining the fluid in the morning.

48. *Sneha* is prepared with either water or some such fluid as decoction, expressed juice, milk, butter-milk, etc., the proportions being as under:

| (Kalka)—Pasty mass. | Medicated oil or ghee | (Fluid) |
|---|---|---|
| 1 | 4 | 16. Water |
| 1 | 6 | 24. Decoction |
| 1 | 8 | 32. Meat juice |
| 1 | 8 | 32. Milk, Curds etc., |

N. B. In the case of the last two, additional water to the extent of four times the (*Sneha*) may be added, if necessary.

When more than one variety of fluids are required, then up to four such sorts the usual proportion of four parts of fluid to one of Sneha should be taken, and the varieties should be boiled separately. But when the number of fluids required exceeds four, each of the fluids should be equal in quantity to the Sneha, and all should be mixed and boiled together.

When the *Sneha* is intended to be prepared in decoction only, the pounded mass, left after the decoction is strained,

may also be added to the mixture before it is boiled. But when it is expressly desired that the remains (*Kalka*) of decoction are not wanted, they should be discarded.

When flowers are to be used in the preparation of the *Sneha* the proportion of flowers, oil and water should be 1:8:4:

49. *Sura; Suramanda; Kadambari; Jagal; Medak; Surabeej*:—These comprise medicines that are the products of fermentation. The following are the different forms of wines that are mentioned in the Ayurvedic literature:—*Varuni; Sooktha* or *Shuktha; Chukra; Gudasooktha; Ikshusooktha; kanjika; Thushambu; Sowweera; Aaranala; Dhaynamla; Mandaki;* or *Shundaka.*

50. *Suras* are preparations similar to wines and tinctures. The ingredients are dissolved in strong alcohol (spirits) and filtered or decanted. The clear liquid is used.

51. *Svarasas* are fresh expressed juices (Succus) prepared by pounding green fresh medicinal plants in a mortar and expressed and strained through a clean cloth or linen. One should see beforehand that the plant is not infested with worms and/or injured by inclemencies of weather. The *Svarasas* contain only those prniciples, which are dissolved in the sap. (When fresh drugs are not available, and in the cases of plants like "*Guduchi*", whose juice cannot be extracted, water should be added to the pounded drug in the proportion of 2:1, and kept for a day and night; the mixture should then be strained and the solution used).

52. *Tailams or Tailas,* (Medicated Oils):—These are prepared in the same way as *Ghritas,* substituting oil for ghee. These preparations are mostly used externally; are also prepared by boiling drugs in water, milk, or other liquid substances, mixed with oil and heated until the water is evaporated. The oils thus prepared are very useful and are generally meant for local application; *a few preparations of this class are taken internally.*

53. *Tailapaka* are medicated oils. In preparing these, sesamum oil is used unless otherwise specified. Sesamum oil before being boiled with medicinal substances is first of all heated to deprive it of any water by evaporating. It is then purified by steeping in it the following substances for 24 hours, viz., madder 1/16, or 1/6 part in weight of the oil, turmeric, wood of Symplocos racemosa, tubers of Cyperus rotundus, a bark called *nalika*, the three myrobalans, root of Pavonia odorata and the tender shoots of Pandanus odoratissimus, each one-sixtyfourth part in weight of the oil. These ingredients in fine powder should be soaked in the oil, with the addition

of an equal quantity of water for a day. The mixture should then be boiled till the water is evaporated, and finally strained through clean cloth. To the oil thus prepared, medicinal substances in the form of paste, (*kalka*), decoction, (*Kashaya*) etc., are added, if necessary in the same proportions as for the preparation of *ghritapaka*. They are then boiled together till the watery parts are all evaporated. *As in the case of ghrita, the vessel should be one of earth, copper or iron.* When cool, the oil is strained through cloth so as to separate the solid particles, and kept for use. Some medicinal oils, and especially those used in the treatment of nervous diseases, rheumatism etc., are subjected to a third process of boiling with various aromatic and fragrant substances. This is called *Gandha-paka* or boiling for rendering the oil fragrant. To render the oil fragrant, the following substances are used:—Elettaria cardamomum; Eugenia caryophyllata; Cinnamomum tamal; Aloe vera; Curcuma zedoaria; Piper cubeba; Cinnamomum zeylanicum; Crocus sativus; Santalum alba; Valeriana jatamansi; Cyperus rotundus; Boswellia serrata; Storax officinalis; Piper longum-root; Andropogon muricatus; Unguis odoratus; Civet cat's pouch; Anisochilus carnosus; Preputial dried secretion of musk animal; Parmelia perlata; Saussurea lappa; Hibiscus abelmoschus. For 4 seers of oil, (one seer according to the South Indian Physicians is equal to 80 tolas; but Bengal Physicians take 64 tolas for a seer), one tola of each of such fragrant ingredient should be taken, excepting camphor, which should be 4 tolas. These ingredients, with the exceptions noticed below, are reduced to a paste with water and added to the oil, which is then boiled with an equal quantity of water, till the latter is evaporated and lastly strained. Camphor, musk, storax, and the substance called *nakhi* should be added after the process of *Gandhapaka* boiling is finished and the oil is strained. Oils for rheumatism and nervous diseases, are sometimes rendered fragrant by the addition of camphor alone.

Medicated oils can be roughly classed as:—(1) powerful stimulants and counter-irritants; (2) Cooling and sedative. They are quick in action, have a nourishing and stimulant effect on the organism and produce sensation of heat. Their massage reduces local congestion and inflamation, loosens stiff muscles and ligaments, and tones up the circulation in the affected part. The massage should only be carried out along the direction of the hair on that part, and should preferably be followed by fomentation, or by being wrapped up in a warm piece of clothing. *Internal administration of oils should be carried out under medical advice and supervision.*

Castor oil and mustard oil are sometimes used in the preparation of medicated oils. The proportions of oil, medicinal substances and fluids are the same as with the sesamum oil, but the methods of purifying them are different. Mustard oil is purified by being boiled with the following ingredients, viz., Emblica officinalis, or E. phyllanthus; Curcuma longa; tubers of Cyperus rotundus; root or root-bark of Aegle marmelos; bark of Punica granatum; flowers of Mesua ferrea; Nigella sativa seeds; Andropogon muricatus; root of Pavonia odorata; the bark called *nalika;* and belleric myrobalan, two tolas each; and Rubia cordifolia, 16 tolas for 4 seers of oil. These should be boiled together with 16 seers of water, till the latter is all evaporated, and the oil should then be strained. It is now fit for being boiled with medicinal substances, the process for which is the same as for sesamum oil above described.

For purifying castor oil, the following ingredients are used:—viz., Rubia cordifolia; tubers of Cyperus rotundus; Coriandrum sativum, the three myrobalans; leaves of Sesbania aculeata; Pavonia odorata; wild dates; tender red buds of Ficus Bengalensis; Curcuma longa; wood of Berberia aristata, or B. Asiatika; the bark called *nalika,* (Onosma echioides); Ginger; and the shoots of Pandanus odoratissimus, each half a tola for 4 seers of oil. Castor oil should be boiled with equal parts of whey and *kanjika,* (plain conjee or fermented paddy water) along with the above ingredients.

**General Instructions regarding the preparation of Medicinal oils and Medicinal Ghritas (Ghees):—**

These are, in a way, decoctions of vegetable drugs made with the addition of oil or ghee, and form a prominent feature or Ayurvedic practice. Many varieties of them are prepared and these are used both internally and externally. The ghees are chiefly used internally and the oils generally externally.

**Preparations:**—The menstruum in which these medicinal ghees or oils are prepared may consist of water alone or of decoction or of expressed juice of vegetable drugs. As a general rule, the proportion of the different ingredients used is as follows:—Medicinal substances well-pounded with the addition of water so as to form a pasty mass, one part; ghee or oil, four parts; and water, expressed juice, or decoction, sixteen parts. These are boiled till the whole of the watery portion is evaporated and nothing but oil remains.

When decoctions are to be used as menstruum the proportion of drugs to water, in ordinary cases, should be one to four:

and the mixture should be boiled till it is reduced to one-fourth of its measure. But when the drugs are hard, woody, or difficult to be easily dissolved, additional quantities of water have to be taken to prepare the decoction. So, in the case of soft, medium, and hard drugs the proportions of water should be four, eight, and sixteen respectively to one, of the drug.

When decoctions used for menstruums are required on a larger scale, the proportion of water taken to prepare those decoctions goes on decreasing. The proportions are as follows:—

| Quantity of Decoction (ready) | Proportion of water |
|---|---|
| 1 to 4 tolas .. .. .. | 16 times. |
| 4 to 16 tolas .. .. .. | 8 times. |
| 16 to 16384 tolas .. .. | 4 times. |

[Page 247 of Dr. Savnur's Hand-Book of Ayurvedic Materia Medica (1950)].

54. *Thandulajala,* (Rice-water) is prepared by thoroughly mixing with the hand 1 part of rice with (washings) 8 parts of water.

55. *Vanaushadhi Kalpas:*—The Deccan Ayurvedashram Pharmacy, Ltd., Hyderabad, (South India), state that, in these days, when it is very hard to procure genuine and fresh medicinal herbs, they, in order to overcome this practical difficulty, have prepared different *Kalpas* from genuine and fresh herbs, *which keep well for a long time without any deterioration as to their therapeutic value;* they are said to have been manufactured under expert supervision with scientific technique, and are guaranteed against adulteration or impurity. *The great advantage of these Kalpas is the small dosage in which these can be therapeutically administered.*

56. *Vataka or Vatika:* (See also:—Gutikas), are pills usually prepared by reducing a decoction of vegetable substances to a thick consistency and then adding some powders, or drugs or articles such as, water, treacle, raw sugar, honey, gum, *guggul,* as the case may be, for making a pill mass. Water or honey are usually the only *anupans* for administering pills, where none else are mentioned. See also *Gudika.*

57. *Vatikas:*—See:—Gudikas or Gutikas.

58. *Vesavar* is a type of medicinal spices containing aromatic drugs.

59. *Vilepee* decoction is prepared by putting 1 part of the cereal, in 4 parts of water, and the thick mixture is boiled till it becomes viscous.

60. *Yavagoo* or *Yawagoo* decoction, is prepared by putting 1 part of the cereal, in 6 parts of water, and the whole mixture is boiled till it gains the consistency of gruel; and becomes so thick that the liquid portion is scarcely left in it. Rice, Phaseolus radiata; Phaseolus mungo and Sesamum are used in this preparation.

61. *Yoosha*: See Peya.

N. B.:— "*Kashayas, Kvathas, Asavarishtas, Avalehas, Ghritas, Tailas,* are regular preparations of crude drugs containing varying quantities of the proximate principles according to the process through which the drugs are made to 'pass'. (Dr. H. V. Savnur).

**Publications consulted.**

1. Indian Therapeutics (1928) by Dr. D. V. Sandu.
2. List of Raw Drugs & Medicinal Preparations (1926), published by Government of Madras.
3. Guide to Indigenous Drugs (1949) by J. R. Goyal.
4. Fundamental Principles of Ayurvedic Medicines, published by the Government of Madras.
5. A Hand Book of Ayurvedic Materia Medica with principles of Pharmacology & Therapeutics, Vol. I (1950) by Dr. Savanur.
6. Clinical Application of Ayurvedic Medicines etc., (1924), by Zandu Pharmaceutical Works, Ltd., Bombay, 13.
7. Index Book and Therapeutic Guide (1928 Edn. & 1943 Edn.) published by the Deccan Ayurvedashram Pharmacy, Ltd., Hyderabad. (Deccan).

## APPENDIX VII

Therapeutic Agents, with their Definitions, brief explanations and a few examples.

1. *Abortifacient:*—Inducing expulsion of the foetus.

2. *Abortive:*—(*Pataneeya*) (Hind:—Aurton Ke Kapre jari Karnewali).—See Abortifacient; aborticide.

3. *Absorbents:*—Drugs or medicines that destroy acidity in the stomach and bowels and produce absorption or exudation of diseased tissue. Absorbents stimulate those blood vessels and glands, which work together in absorption, and poisonous or irritant substances are carried off by them. Absorbents are used in diarrhoea or vomiting. Antacids (Q. V.)

and Cathartics (Q. V.) belong to this class. When gases or substances in solution get fixed on the surface of a solid, they are said to be absorbed. Absorbents are used in medicine to remove undesirable substances like toxins or poisonous gases in the intestine, i.e., they are drugs used to cause absorption of irritating secretions on the surface of the body, or of gaseous products from the gastro-intestinal tract, e.g., Magnesia; Prepared Chalk; and Wood Charcoal.

4. *Absorptives*: — (See also: —Resolvents; Counter-irritants). Cause the absorption of products of inflammation.

5. *Acids*: —These are salts of hydrogen, which give acid-reaction with blue litmus paper or neutralise alkalinity. They are mineral and organic; e.g., Hydrochloric, Acetic, Nitric, Sulphuric, Phosphoric, Nitro-hydrochloric, and Citric acids.

6. *Acrid*: —Producing irritation, as of the tongue, etc.

7. *Adipogenous*: —An agent that produces fat.

7 (a). *Adsorbents*: —Solid substances, such as charcoal, which adsorb a vapour in contact with them.—See also: — Absorbents.

8. *Alexipharmic*: —A medicine neutralising a poison.

9. *Alkalies*: —See: —Antacids.

10. *Alkaloids*: —Natural organic bases found in plants; characterised by their specific physiological action. Alkaloids may be related to various organic bases, the most important ones being pyridine, quinoline, isoquinoline, pyrrole, and other more complicated derivatives. Most alkaloids are crystalline solids, others are volatile liquids, and some are gums. They contain Nitrogen as part of a ring and have the general properties of amines.

11. *Alteratives*: — (Parivartakas); (Hindi: —Badal-dene-wali); —See also: —Resolvents and Discutients. Medicines that "alter" the morbid or unhealthy processes of nutrition and excretion, restoring in some unknown way, (perhaps by promoting embolism and metabolism), the normal functions of an organ or of the system without producing any sensible effect, or obvious impression on any of the organs of the body. Their action is inexplicable e.g., Mercury; Potass-iodide; Gold salts; Sarsaparilla; Sulphur; Colchicum; Arsenic; Iodine. Emetics and tonics belong to this class.

12. *Anaesthetics*: — (Angamardashamana): (Hindi: —Besurat Karnewali; Sunnkardenewali): —Drugs or substances, that produce temporary loss of sensation, or local insensibility, and consciousness from its effects upon the brain, or nerve-

fibres, and spinal centres; i.e., taken internally cause general unconsciousness.

13. **Anaesthetics:—(General):**—Comprising of certain volatile substances, which, when inhaled in sufficient quantities, produce loss of sensation and consciousness from their action on the brain and the Spinal centre:—e.g., Chloroform; Ether; Nitrous Oxide Gas; Bromoform.

14. **Anaesthetics (Local):**—Which act by affecting the sensory nerves of the skin or the mucous membrane, when the drug comes in contact with them, until their power of receiving or conducting sensations is lost; e.g., Cocaine; Carbolic Acid; Ice; Veratrine; Ether in the form of spray.

15. **Anaesthetics (Spinal):**—acting, (when injected into the spinal fluid) through the sensory roots of the spinal cord. Hence they produce anaesthesia of the lower part of the body.

16. *Analeptic:*—Any agent restoring strength after illness, i.e., during convalescence e.g., Gentian bark; Nourishing foods and tonics.

17. *Analgesic* :—See:—Anodyne :—(Vadanashamana); (*Hindi:*—Sakornewali):—A remedy or drug taken internally, that relieves actual pain either by depressant action on the nerve centres, or by impairing the conductivity of nerve fibres, (brain). These do not produce loss of consciousness. E.g., Opium; Aspirin; Antipyrine; Indian Hemp; Belladonna; Aconite; Chloroform; & Antifebrin.

17. (a) N. B.:—Analgesics and Anodynes act by depressing the sensory centre or by reducing the activity of the sensory nerves. E.g., Datura fastuosa; Papaver somniferum.

18. *Anaphrodisiac:*— See:— *Antaphrodisiac*):—(*Viryanashana*):—(*Hind:—Namarad-Karnewali*). That which allays or diminishes or weakens the sexual passion, power and feeling; e.g., Bromides of Ammonium and Potassium; Tobacco; Hemlock; Camphor; Iodides of Sodium & Potassium. These act by limiting the supply of blood to the generative organs and by lowering the excitability of the peripheral nerves or the nerve centres.

19. *Anaphylaxis:*—This term was originally used to explain a condition opposite to immunity, but it is now used to designate all artificiallly induced conditions of hypersensitiveness in man and lower animals.

20. *Anhidrotics:*—(*Svedaghna*): (*Hindi:*—Pasina rokne wali). Agents that check or diminish profuse sweating, (general or local); e.g., Belladonna; Hyoscyamus; Atropine; Stramonium; Muscarine; Quinine; Zinc-salts; Vegetable and Mineral Astringents; Picrotoxin in small doses. These act by depressing the function of the sweat-glands, by limiting the circulation, or depressing the nerve-centres.

21. *Anodynes:*—*(Sulaprasamana)*; *(Hind:—Sakornewali)*:—Drugs which give local relief from ill-defined pain, and general discomfort, mostly by their action on the sensory nerves; e.g., Belladonna; Sali-cylates; Camphor. Anodynes are divided into three kinds, viz., Sedatives, Hypnotics, and Narcotics.

22. *Antacids:*—*(Pittaghna)*:—*(Hindi :—Pitmarnewali)*: —See:—Alkalies:—Substances counteracting or neutralising activity in the stomach; e.g., caustic soda and Potash with their carbonates, Bicarbonates, Acetates; Citrates; Oxides; Ammonia and Magnesia with their preparations; Chalk; of this class these are those, which act *directly,* as Soda does upon the gastric membrane, and those which also act *indirectly*, through the blood. E.g., Carbonates of Potassa.

23. *Antagonists:*—(Physiological)—are drugs having opposite effect. E.g., Chloral and Strychnine; Belladonna and Opium; Atropine and Muscarine; Atropine and Hydrocyanic Acid; Atropine and Physiostigmine; Atropine and Pilocarpine; Digitalis and Saponine; Alcohol and Strychnine.

24. *Antalkaline*: *(Hindi: Balgham ko kam karnewali)*: —Those drugs which neutralize an alkaline state of the system; e.g., Citric Acid; Lemon-juice; Tartaric Acid.

25. *Antaphrodisiac—See:—Anaphrodiasiac*:—An agent that lessens the venereal impulse, i.e., sexual passion and power.

26. *Antemetic:*— *See:*—Antiemetic:—*(Hindi:*—Qui ya ubkai roknewali).

27. *Anthelmints* or *Anthelmintics:*—(Krimighna)):—*(Hind* :—Kiremarnewali):—See :—"Teniacides"; "Vermicides"; "Vermifuges"; Antiscolics:—Agents which either directly or indirectly kill or render powerless and expel intestinal parasites or worms in the alimentary canal (round, tape, broad and thread): e.g., Santonin; Thymol; Pelletierine; Turpentine; internally;—Salt water and Quassia by enema;—Mallotus philippinensis; Embelia ribes; Cowhage; Scammony; Male fern root; Calomel; Gamboge; Chenopodium.

28. *Antiarthritic:*—A remedy against gout, rheumatism, or affections of the joints. Antacids and tonics belong to this class.

29. *Antibiliary* or Antibilious, are medicines which are useful in bilious affections; e.g., Calomel.

30. *Antibodies* are specific protective substances produced by the tissue cells of the host in response to an antigen.

31. *Antibiotics:*—are antibacterial agents.

32. *Anticoagulant:*—Any substance which causes drawn blood to remain liquid instead of coagulating.

32. (a) *Anti-convulsives* check convulsive disorders due to blood deterioration, and nervous debility; included in tonics and anodynes.

33. *Antidiabetic:*—Medicine preventing or overcoming diabetes.

34. *Antidotal:*—See:—Antidote; Antipharmic.

35. *Antidote* :— *(Vishaghna)*; *(Hindi* :— *Zahron-ki-marq)*; Counteracting the action or effect of poisons. E.g.:—Potass permanganos, in opium poisoning; Lime for sulphuric acid. Antidotes are *Chemical, Physiological* or *Vital.*

36. *Antidysenteric:*—A medicine serviceable against dysentery.

37. *Anti-emetic:*—(Chherdinashana)—Relieving nausea, and preventing emesis or vomiting. Included among stimulants and anodynes.

38. *Antifebrile:*—An agent reducing a fever.

39. *Antifermentative:*—An agent that prevents fermentation.

40. *Antigalactic or Antigalactagogue:*—A drug that lessens the secretion of milk.

41. *Antigen* is a substance, which when used parenterally is capable of causing the development of specific antibodies in animals. Any foreign protein may act as an antigen.

42. *Antihydrotics:*—Lessens the secretion of sweat; a drug which diminishes perspiration.

43. *Antilithics:*—*(Mutrasangrahaniya)*; *(Hindi:—Peshal kam lanewali)*; See also:—Lithontriptics. Agents preventing or dissolving the deposit of renal, vesical or biliary calculi or sediment; medicines used for the relief of calculous affections; e.g., Saxifraga ligulata; acids for phosphatic; alkalies for uric acid calculi, castile soap and salicylate of Soda for gall-stones.

44. *Antineuralgic:*—Overcoming neuralgia.

45. *Antiparasitics*: *(See: "Parasiticides"; "Antiseptics")*. Destroying or preventing increase of parasites, infecting the surface of the body. These are antiseptics also; e.g., Sulphurous and Carbolic acids; Iodide of Sulphur; various mercurial salts.

46. *Antiperiodics:*—*(Jwarahara)*; *(Hindi: Bukhar ko dur karne wa roknewali)*:—Remedies which antagonise the

poison of periodic disorders, like ague, (malaria), neuralgia, etc.; medicines used for the relief of malarial fevers. Included among tonics also. e.g. Quinine; Arsenic; Iodide.

47. *Antipharmic:*—(*Hindi: Zahron ki maraq*); *See:*—*Alexipharmic;* Antidote; Antidotal.

48. *Antiphlogistics:*—These are external applications employed to reduce inflammations, whether internal or external. Emetics; cathartics; purgatives; diaphoretics; diuretics; and refrigerants are also included in this class; e.g., Iodine; Mercury; Aconite; Veratrum viride; Antimony.

49. *Antipruritic:* (*Kandughna*):—Relieving the sensation of itching.

50. *Antipyic* means checking or restraining suppuration.

51. *Antipyretic:*— *See:*— *"Febrifuge":*— (*Jvarabhanjeeya*) (*Hindi: Hararat ko kam karnewali*):—Reducing the temperature of the body in pyrexia, i.e., fever and diseased conditions. These act (1) by lessening heat production through the heat centres, (Quinine); (2) by neutralising or destroying the toxine of the fever (Quinine); (3) increasing loss of heat by diaphoresis, (salicylates; alcohol); and (4) by heat abstraction (cold baths, diaphoretics, sudorifics).

52. *Antirheumatic:*—An agent relieving or curing rheumatism; e.g., Colchicum; Iodide of Potash.

53. *Antiscolics:*— *See:*— Anthelmintics; Vermifuges; Vermicides.

54. *Antiscorbutic:*—A remedy for or preventive of scurvy, to check blood derangements. These are also embraced in tonics, e.g., Citric Acid.

55. *Antiseptic:* (*Shodhaneeya*); (*Hindi: Dhonewali wa ankur lanewali*):—See:—Bacteriostatics. A remedy that arrests or prevents putrefaction, or, what is the same thing, the bacteria upon which putrefaction depends. Antiseptics or Bacteriostatics are substances which prevent or retard the growth of micro-organisms as long as they remain in contact with them but do not destroy them; e.g., Borax; Boracic Acid; Camphor; Charcoal; Vinegar; Creosote; Carbolic Acid. These should not be compounded with disinfectants like hot air, which destroy the germs causing disease, or with Deodorants like Chlorine or Charcoal, which destroy fetid smells and emanations.

56. *Antisialagogues:*—*See:*—*Antisialics:*—Drugs which decrease or check the secretion of saliva; e.g., Atropine and physostigma in large doses.

57. *Antisialic or Antisialagogue*:—Checking the secretion of saliva, causing dryness of the mouth; e.g., Atropine.

58. *Antispasmodics*:—(*Svasahara*) (*Hindi*: *Badan ki ainthan wa maror ko dur wa kam karnewali*):—Agents which relieve, prevent or control morbid spasms of voluntary or involuntary muscles (nervous irritability), relieve convulsions, and pains unattended by inflammation, in any part of the body. These include drugs which paralyse motor centres; e.g., Chloroform; (2) Drugs depressing the motor centres; e.g., Bromides; (3) Medicines causing the expulsion of gas from the intestines and relieving colic; e.g., asafoetida, Cajuput, castor, Valerian, Carminatives and Aromatics; (4) Medicine overcoming the spasm of the bronchial tubes; e.g., Datura; Adrenalin; Lobelia; Stramonium; Belladonna; Hyosciamus; Ammonia; Asafoetida; Galbanum; Valerian; Ether; Camphor; Opium; Chloroform; Oxide of Zinc; Calomel.

59. *Antisyphilic or Antisyphilitic*:—A remedy directed against, or used for the relief of Syphilis. Usually an alterative.

60. *Antitoxin*,—is a serum, or a preparation from serum containing the antitoxic globulins or their derivatives which have the specific power of neutralising the toxins formed by a micro-organism.

61. *Antizymotics*:—Agents preventing the process of fermentation, either by destroying or rendering inactive, the causative ferments; an antiferment.

62. *Aperient*: (*Bhedaneeya*); (*Hindis—Dast Khol kar lanewali*):—A mild purgative or laxative. e.g. Rhubarb; Manna; Grey powder.

63. *Aphrodisiac* (*Vajeekarana*); (*Hindi*:—*Namardi-ki-dawa*). Stimulating or increasing the sexual appetite, passion and virile power. E.g., Strychnine; Damiana; Cannabis indica. They act on the genital centre of the cord and brain. They may also act indirectly by irritating the bladder and urethra as Cantherides.

64. *Appetizer*:—A remedy or dose, taken to stimulate the appetite.

65. *Aromatics*:—*See*:—*Fragrant*: (*Sugandhitadravya*) (*Hindi*:—*Khush-buen*). Substances characterised by a fragrant, cordial, spicy taste, and/or odour, and containing volatile oils and stimulants to the gastro-intestinal mucous membrane. E.g., Cardamoms; Cinnamon; Orange-peel; Nutmegs; Cloves; Cubebs; Fennel seeds; Peppermint.

66. *Astringents:*—(*Sankeshaneeya*); (*Hindis Bandhej-karnewali*). Agent producing condensation or contraction of organic tissues, muscular living fibres, or arresting haemorrhages, or lessening secretions of the mucous membranes, such as those of the stomach and of the intestines, etc., by precipitating albumin and gelatin. E.g., Tannic and Gallic acids; Alum; Lead Acetate; etc., act in this way; Mineral acids and most metallic salts, creosote. Their action may be local, constitutional or remote. Astringents are divided into vegetable and mineral. Astringents are applicable in arresting unhealthy discharges depending upon weakness of the blood vessels, or when the discharge is kept up by habit when the exciting causes are removed, or when the discharges are very profuse.

67. *Attenuant:*—An agent increasing the fluidity or thinness of the blood or other secretion; e.g., Ammoniated iron.

68. *Bactericide:*—*See:*—*"Disinfectants" & "Germicides"*—An agent that destroys bacteria.

69. *Bacteriophages* are lytic agents, which are ultra-microscopic vira according to some workers, and are said to be non-living substances of the nature of enzyme according to a few other research workers.

70. *Bacteriostatics:*—See:—Antiseptics .

71. *Balsamics* are medicines of a soothing kind. E.g., Tolu; Peruvian balsam.

72. *Biliary lithontriptics* are drugs used to dissolve gall-stones.

73. *Bitters:* Medicines characterised by a bitter taste. Bitters are of three kinds:—(1) Bitters aromatic; medicines that unite the properties of aromatics with those of simple bitters; (2) Bitters simple; medicines that stimulate the gastro-intestinal tract, without influencing the general system; and (3) Bitters styptic; medicines that add styptic and astringent properties to those of bitterness.

74. *Cardiac:*—Pertaining to the heart.

75. *Cardiac Stimulants* are drugs which maintain an efficient circulation, when the heart fails to perform its function, by improving its activity.

76. *Cardiant:*—A remedy that affects the heart.

77. *Carminatives* (*Deepaneeya*); (*Hindi:*—*Bao Haran; Aphra dur karnewali*) (*See: under Antispasmodics*). Calming or soothing medicines, that act by relieving pain in the stomach and bowels and expel flatulence and gas from the

stomach or intestines (alimentary canal), by increasing or regulating peristalsis. Their action on the stomach depends on their power of relaxing the muscular fibres or the gastric orifices.

78. *Cathartics*:—(*Bhedana*); (*Hindi*: *Kara julab*) See: Aperients; Evacuants; Purgatives. These are divided into:—(1) *Laxatives*:—Figs; Prunes; Sulphur; Olive Oil; (2) *Simple purgatives*, which act by stimulating the glands:—Senna, Castor Oil; Aloes; (3) *Drastics*:—rather acting intensely by irritating the mucous membrane of the intestines:—Jalap; Colocynth; (4) *Hydrogogues*:—which produce fluid motions:—Croton Oil; Colocynth; Epsom and Glauber's Salts; (5) *Cholagogue-purgatives*, which act by stimulating the liver:—Rhubarb, Calomel, Aloes.

78(a). **Vegetable Cathartics** are classified by Cushny on a chemical basis as follows:—(1) Anthracene purgatives containing principles, which are derivatives of anthraquinone; Rhubarb; Aloes; Cascara and Senna. (2) Purgative Oils:—Croton Oil; Castor Oil. (3) The Jalap group, which are all resinous substances:—Jalap; Scammony; Podophylline; and Colocynth.

78(b). **Mineral Cathartics**:—Sulphur; Carbonate of Magnesia; Sulphate of Soda; Sulphate of Magnesia; Sulphate of Potassa; Bitartrate of Potassa; Tartrate of Potassa; Tartrate of Potassa and Soda; Phosphate of Soda; Calomel.

79. *Ciliary Excitants*:—are medicines, which when sucked in the mouth, promote expectoration of bronchial mucus by reflex action; e.g., Chloride of Ammonium; Chlorate of Potassium; Gum Acacia; native Chloride of Sodium.

80. *Caustic*:—(*See*:—*Escharotics*). (*Kustagna*); (*Hindi*: *Katnewali; Dagnewali; Khajkarnewali*). Substances that destroy or disorganise living tissue, by destroying the vitality of the part on which it is applied. It causes sloughing and inflammation of the surrounding area where applied. These are substances, which, when placed in contact with the living body, destroy the tissues, decompose the animal fluids and give rise to the formation of slough or eschar.

80(a). *Cautery*:—Primarily, the term was applied to caustics, but more frequently now to the platinum wire heated by an electric current, or, the term 'Actual Cautery' is applied to the hot iron, for counter-irritation, removal of tissues, etc.

81. *Cerebro-Spinants*:—Medicines which influence the brain and spinal cord. They may be paralysers, stupefacients or intoxicants. (Great care should be exercised in using these).

82. *Chemotherapeutics*:—Drugs used in cases of diseases caused by micro-organisms or other parasites, in the specific

treatment of infection, e.g., treatment of syphilis by organic arsenic preparations; of amoebic dysentery by emetine, and of malaria by quinine.

83. *Cholagogues:*—(*Mridubhedana*); (*Hindi:*—*Halka Julab*); *See also:*—*Cathartics.* Remedy which stimulates the action of liver, empties the gall bladder, promoting or increasing the secretion or excretion of bile, and produces free purgation at the same time. Also included in Cathartics; hepatic stimulants; e.g., Sodium Salicylate; Soda salts; Fel Bovinum; Chloride of Ammonium; dilute Nitro-Hydrochloric Acid.

84. *Choleretics:*—Drugs which increase secretion of bile.

85. *Coagulants:*—Drugs that hasten blood coagulation in haemorrhage.

86. *Convulsions:*—Medicines that cause convulsions.

87. *Cordial:*—Pertaining to heart; exhilarant or stimulant; e.g., Aromatic confections.

88. *Corroborants:*—Are medicines and foods which increase the strength; e.g., Iron; Gentian; Meat; Wine.

89. *Corrosive:*—A substance that destroys organic tissue either by direct chemic means or by causing inflammation and suppuration.

90. *Counter-Irritants:*—(*H i n d i:*—*Uparnewali*):—An agent that produces superficial and artificial inflammation, in order to exercise a good effect upon some adjacent or deep-seated morbid process. Counter-irritants include or are divided into:—(1) Rubefacients; (2) Epispastics or Vesicants; (3) Absorptives; (4) Caustics or Escharotics; (5) Revulsives and Derivatives. Counter-irritants are also stimulants. E.g., Mustard plasters or blisters; Mustard baths. These are agents used with the object of diminishing, counteracting, or removing some remote irritation or inflammation existing in the body.

92. *Deliriants:*—Agents that act on the brain, so as to disorder the mental faculties and produce confusion of will-power; medicines tending to have a sedative influence over the heart and circulation, included in cerebro-spinants, causing delirium; e.g., Datura; Cannabis indica.

93. *Delirifacients* are drugs which produce delirium, followed afterwards by stupor; e.g., Cannabis; Belladonna; Hyoscyamus; Coca.

94. *Demulcents:*— (*Mridukara*); (*Hindi:*—*Tarkarnewali*); *See also:*—*Emollients.*—Substances of a viscid character, soothing or protecting mucous membranes, and the parts to which they are applied, from irritation; unirritating sub-

stances which form with water a viscid solution. E.g.:—Gum arabic; Tragacanth; Flaxseed; Liquorice-root; Sago; Tapioca; Arrowroot; Barley; Marshmallow; Mallow; Isinglass; Suet, Wax; Linseed; Olive and Almond oils; Starch; Glycerin. These also soothe and protect the air passage from the cold air in colds or obstinate coughs; protect the coating of stomach from the evil effect of corrosive or irritating acids, poison, etc., also used to protect the mucus membrane of the urinary organs from acid action of the water in kidneys or bladder troubles; used by the mouth or by injection; in short, are oleaginous and mucilagenous substances forming a soothing protective viscid coating.

95. *Dentifrices:*—These are powders or paste used for the purpose of cleaning the teeth and the gums.

96. *Deobstruent:*—A medicine that removes functional obstructions of the body; e.g., Iodide of Potash.

97. *Deodorants:—See Disinfectants; Antiseptics; Deodorisers, etc.;—(Durgandhanashaka)*; *(Hindi: Sarand ko sokhjanewali)*—Those which destroy, remove, or correct, or hide offensive or disagreeable, or fetid odours and emanations. These are volatile or non-volatile. These may or may not be antiseptics or disinfectants.

98. *Deodorisers:*—Substances that destroy offensive odours.

99. *Depilatory:*—A substance used to remove or destroy the hair.

100. *Depressant:—See:—Sedative:*—A medicine that retards or depresses the physiologic action of an organ, i.e., lowers functional activity.

101. *Depurant or Depurative:*—A medicine that purifies or cleanses the animal economy.

102. *Derivatives or Revulsives:*—Are remedies which are supposed to remove, divest or draw a morbid process or the diseased action from its seat of mischief to the place of their application; e.g., Cantharides; Turpentine; Ammonia; Camphor; Mustard; most volatile oils; Mezereon; Capsicum; Croton Oil, etc.

103. *Desiccant:—(Vranaropaneeya)*; *(Hind:—Ghaosukhanewali)*:—Drying medicines or applications, which when applied to open wounds or injured parts, form with the discharged matter a scab and thereby protect them from external influences.

104. *Detergent:*—A drug purifying and cleansing wounds, etc., cleaning the surface over which it passes; e.g., Soap.

105. *Diaphoretics:—See:—Sudorifics:—(Svedaneeya)*; *(Hind:—Pasina lanewali)*—A drug which increases the action of the skin and promotes the secretion of perspiration or sweat, which they do either by stimulating the terminal nerves in the cells of the sweat glands, such as *Jaborandi* (pilocarpine), or by causing dilatation of the superficial capillaries, as Ipecac, Opium, Alcohol, or by stimulating the sweat centres in the spinal cord, as the spirit of nitrous ether. Diaphoretics are milder in action, while Sudorifics cause excessive perspiration; e.g., Acetate of ammonia; Calomel; Antimony; Opium; Camphos; Sarsaparilla; Ipecacuanha.

**Diaphoretics are of three classes:**—(1) Nauseating diaphoretics; e.g., Ipecacuanha; Tartrate of Antimony & Potassa.

(2) Refrigerant diaphoretics:—Citrate of Potassa; Acetata of Ammonia; Nitrate of Potassa.

(3) Alterative Diaphoretics:—Sassafras; Sarsaparilla.

106. *Digestants:—See:—Digestives.*

107. *Digestives* are agents used to assist the stomach and intestines in their normal functions of promoting digestion of foods; e.g., Pepsin; Malt Extract; Papain; Trypsin; Taka-diastase.

108. *Diluents:*—Agents that dilute the secretions of an organ or that increase the fluidity of secretions; preparations used to quench thirst and which dilute and thin the thickened blood and cool the fever system. Diluents are chiefly watery compounds and also remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin; e.g. weak tea; water; thin broth; gruel; weak infusions of balm, horehound, pennyroyal, ground-ivy, mint, sage.

109. *Discutient:—See also:—Resolvents; Alteratives:*—A medicine supposed to have the power of repelling or resolving or scattering a swelling, tumours, etc., e.g., Galbanum; Mercury; Iodine.

110. *Disinfectant:—See:—Deodorants; Antiseptics:—(Aguntaka-roganashaka)*; *(Hind:—Urkar lagnewali; bimariyon ko rokne aur dur karnewali)*. An agent that actually destroys disease-germs and noxious properties of fermentation or putrefaction. Disinfectants, bactericides or germicides destroy pathogenic microbes, i.e., those which cause communicable diseases. *All disinfectants are in a way antiseptics, but all antiseptics are not disinfectants.*

111. *Diuretics:—(Mutravirochaneeya)*; *(Hindi:—Peshabjari karnewali)*:—Medicines that increase the flow of secre-

tion of urine either by stimulating the renal cells or increasing the flow of blood through them. These also increase the quantity of urine by stimulating the heart and thus acting upon the general circulation. E.g., Nitre; Acetate of potassa; Squills; Juniper; Oil of Turpentine.

Diuretics are as under:—(1) **Stimulating diuretics** act by stimulating the kidneys during their elimination, e.g., Copaiba, Cubebs; Turpentine; Pepper; Gin; Alcoholic liquors; Buchu; Cantherides; Juniper etc.

(2) **Hydragogue diuretics**, act by raising the blood pressure in the glomeruli; e.g., Digitalis; Squill; Casca; Broom; Caffeine, etc.

(3) **Refrigerant diuretics**, act by washing out the kidneys e.g., Large doses of diluents like water, and solutions of the various potash salts.

112. *Drastic:*—(*Hind:—Kara julab*):—A powerful and irritating purgative; e.g., Gamboge.

113. *Ecbolics or Oxytocics:*—(*Garbhasayashodhana*) (*Hind: Aurton ke kapre jari karnewali*):—(See also:—Oxytocics). Those which produce abortion or facilitate parturition; drugs which cause expulsion of the contents of the uterus by contracting the uterine muscle, or muscular fibre; they may be direct or indirect. E.g. Ergot; Borax; Savin; Quinine. Ecbolics in smaller doses are emmenagogues.

114. *Emetics:*—(*Vamakareeya*); (*Hindi:—Qai lanewali*):—Agents that induce or cause or produce vomiting by local action on the nerves of the stomach, mucous membrane, such as common salt, Zinc salts.

Emetics are divided into:—(1) **Central Emetics** act through the vomiting centre of the brain. E.g. Apomorphine; Ipecacuanha; Camomile; Antimony; Copper; Zinc.

(2) **Local Emetics**, as Zinc and Copper Sulphates: Mustard; Carbonate of Ammonia; warm Chamomile infusion; solution of Common Salt, Alum, etc., which act locally by irritating directly the nerves distributed to the gastric mucous membrane.

(3) **General Emetics**, which act through the blood upon the vomiting centre as Tartar emetic; Ipecacuanha; Senega; Squill; Apomorphine etc. Most of these latter drugs are eliminated by the gastric mucous membrane, after absorption, and then also act partly as local emetics. Apomorphine may, however, be regarded as a pure general emetic. Emetics are vegetable and mineral.

115. *Emmenagogues:*—(*Rajasthapaneeya*); are medicines, which by their stimulating action on the uterine fibre (1) directly assist in increasing or restoring disordered menstruation, when deficient or absent as Ergot; Savine; and most Ecbolics; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, etc. Further examples are: Castor, Asafoetida; Galbanum; Mercury; Black-hellebore; Juniper; Pennyroyal.

116. *Emollients (Snehopaga)*; *(See also:—Demulcents)*: *(Hindi:—Jalan aur sozish ko dur karnewali)*:—Oily or fatty protective substances, (external demulcents or protectives) which by external application soften or relax the skin or internally soothe an irritated or inflamed surface, diminishing the pain helping suppuration. E.g., Oils, Honey, Starch, poultices of bread, bran, linseed-meal, carrots and turnips; Spermaceti Cerates; Ointments, hot fomentations, chalk, lard.

117. *Enemata* are medicines in a fluid state injected into the rectum to facilitate the action of other medicines, or to operate upon the bowels, when the stomach is too irritated to allow of their being introduced into the system through it. The composition of the common enemata is (1) salt; (2) Molasses; (3) Lard or Olive Oil; (4) Warm water; (5) Oleum Ricini. The oil of turpentine, asafoetida have also been used as ingredients.

118. *Epispastic; (or Vesicant)*:—*See also Counter-irritants;-Rubefacients*:—*(Doshaghnalepa)*; *(Hindi:—Uparnewali)*; *(See:—Dane paida karnewali)*:—A vesicatory or substance, which applied locally to the skin, produces a blister, causing redness of the surface; E.g. Cantharides; Ammonia; Burgandy pitch; Mustard.

119. *Errhines*:—*(Shirovirochaneeya)*; *(Hindi:—Chink lanewali ya nazla bahadenewali)*:—*See also*:—*Sternutatory*:—Medicines that, applied to the mucous membrane of the nose, increase nasal secretion without causing sneezing, as the vapour of Ammonia, Acetic Acid, etc. There are others, which act reflexly, through the Trigeminal nerve causing sneezing, and are called "Sternutatories", e.g. Tobacco.

120. *Escharotic*:—*S e e* :—*Caustic*:—*(Chhadaneeya)*; *(Hindi: Katnewali; Dagnewali; Khaj karnewali)*. *See also*—: *Caustics*: a substance, when applied to the skin produces an ulcer or applied to any part of the body, destroys the vitality of the part or destroys the tissues, to which it is applied, and causes sloughing and inflammation of the surrounding area; caustic drugs that eat off fungoid growth or excessive granulations; e.g., Blue-stone; Ulnar Caustic; Solution of Chloride of Zinc; Strong Mineral Acids; Soda; Potash; Sulphate of Potassa, Chloride and Peroxide or Potassium; Peroxide of Iron, Lime, etc., Arsenious acid.

121. *Evacuant*:—*See*:—*Purgatives; Cathartics; Aperients;* Laxatives.

122. *Excitant*:—A remedy that stimulates the activity of an organ.

123. *Exhilarant:*—An agent to enliven and cheer the mind.

124. *Expectorants:*— (*Shvasakhasahara*); (*Hind:*—*Khansi aur dame ko dur karnewali*):—Remedies acting upon the pulmonary membranes that promote or alter expectoration; drugs which stimulate and expel the bronchial mucus or secretions, (of the organs of respiration) and help their expulsion. Actions of these are manifold and complicated:—either reflex, local, or central. E.g., Antimony; Ipecacuanha; Squills; Ammoniacum; Tolu; Garlic; Lenega. They act:—

(1) By relieving spasm of the bronchial tubes, as Lobelia, Opium; Stramonium; Tobacco, etc.

(2) By mechanically dislodging it in the act of vomiting, at the same time, thinning the secretion, as all Emetics **in large doses,** notably Antimony; Hippo; etc.

(3) By increasing the flow from the inflamed membrane, through their effects upon its gland-cells, as all the emetic class **in small doses**—Nauseating or depressant expectorants, as Apomorphine; Pilocarpine; Emetine and Tartar Emetic.

(4) By stimulating the membrane in the act of their elimination, they so alter the secretion, that expectoration is rendered easy, as Ammonia, Senega, Ammoniacum, and a host of volatile substances, notably the Onion, Tar, Turpentine, Balsams, Asafoetida, etc. **Stimulating** Expectorants:—Iodine of Potassium by liquefying the secretion, is a valuable expectorant.

(5) By soothing the irritable respiratory centre. Morphine and Chloral may act as expectorants, and render the expulsion painless.

(6) By acting through the impression produced on the nerves of the mouth, many substances aid expectoration. (See:—Ciliary excitants).

(7) By stimulating the respiratory centre, and strengthening the muscles of the expulsive mechanism; Strychnine and Atropine may act as true expectorants.

125. *Febrifuge:*—*See:*—*"Antipyretic"; "Antiperiodic"; "Antiseptic"; (Jvarankusa); (Hindi:—Bukhar ko dur karne-wa-roknewali).* An agent that lessens fever. (Included among diaphoretics and diuretics); E.g., Antimonials; Quinine; Mineral Acids; Arsenic.

126. *Fragrants:*—Medicines having fragrant odour.

127. *Galactafuge:*—*See:*—*Lactifuge.*

128. *Galactagogue or Lactagogue or Lactiferous. (Stanyajanana)*; (*Hind:*—*Dudh Barhanewali*):—An agent that increases the secretion of milk in the breast (lacteal secretion); some of them are applied locally, while others are given internally; e.g., Chlorate of Potassium; Fennel, etc.

129. *Germicide:*—*See:*—*"Disinfectant"; "Bactericide":*—That which destroys germs and worms; a microbicide.

130. *Germifuge:—See:—Germicide.* An agent that expels germs.

131. *Glucosides:*—Crystalline substances, which on hydrolysis, yield glucose and another substance which is usually an aromatic body.

132. *Haematics:—See:—Haematinics.*

133. *Haematinics:—Or Haematics:—(Raktashodhaka); (Hind:—Khun saf karnewali),* are also termed "Blood tonics." Are blood tonics, which either directly or indirectly improve the quantity and quality of red blood corpuscles and haemoglobin in it; e.g., Iron and its preparations; Manganese; Cod Liver Oil; Free Phosphorus; Lime Phosphates; Potassium in small doses.

134. *Haemostatics:—See:—Styptics:—(Shonitasthapana; Raktapittahara; (Hind:—Khun band karnewali): See also:—Styptics.* Medicines taken internally that arrest or restrain bleeding, or haemorrhage by contracting the blood vessels. (Included in Astringents); e.g., Calcium Salts; Serum. *Adrenalin* the active principle of supra-renal gland—Gelatin, and chloride of Calcium, are the best examples. Ergot, Turpentine and lead Salts were supposed to act in the same way. Haemostatics act when given internally; whilst Styptics act locally.

135. *Helminthic; See:—Anthelmintic.*

136. *Hydragogue:—See:—Purgatives; Aperients, etc.* A medicine, which causes free secretion (fluid of dropsy, etc.), from the intestinal glands and removes much serum from the blood-vessels, producing fluid of watery motions or evacuations. E.g., Gamboge; Calomel.

137. *Hypnotic; See:—Soporifics; (Nidrakari); (Hind:—Nind lanewali)* (included in cerebro-spinants):—Drugs or measures that cause or maintain sleep without causing preliminary cerebral excitement. E.g., Hops; Henbane; Morphia; Poppy; Sulphonal; Chloral; Paraldehyde; Urethene etc. (See:—Narcotic; Soporific; Somnifacient).

138. *Insecticide:*—A substance destructive to insects.

139. *Insectifuge:*—See:—Insecticide.

140. *Irritant:*—That which induces irritation or inflammation.

141. *Irritant and Counter-irritants* are certain substances, drugs or measures employed to produce irritation artificially

in some part of the body with the view of diminishing, counteracting or removing irritation or inflammation in some neighbouring part.

142. *Lactagogue:—See:—"Galactagogue"; Lactiferous. (Hind:—Dudh Barhanewali).*

143. *Lactifuge:*—That which lessens the secretion of milk.

144. *Laxative:—(Svalpabhedana); (Hindi:—Dast Khol karnewali):*—An agent that loosens the bowels; mild purgative. E.g., Manna; Tamarinds; Castor Oil; Sulphur; Petroleum; Magnesia.

145. *Lithonlytic:—See:—Lithonthryptic.*

146. *Lithonthryptic or Lithontriptic:—See:—Antilithic:*—A medicine supposed to possess the power of dissolving various concretions in the body, i.e., in the urinary tract, as the acids for phosphatic and the alkalies for uric acid calculi.

147. *Lubricants:*—Substances capable of reducing friction between bearing surfaces in the relative motion, either by virtue of separating them by a viscous fluid film (oil) or by an unctuous solid (graphite), or by providing an absorbed layer of polarised oil molecules at the metallic surfaces.

148. *Masticatory:*—An agent, which when chewed increases the flow of saliva.

149. *Microbicide:—See:—Germicide.*

150. *Mydriatics:—(Netravisteenayoga); (Hind:—Ankh ki putli ko phailanewali):*—Medicines that cause dilatation of the pupil and paralysis of the ciliary muscle, and temporary loss of accommodation; e.g., Atropine; Duboisine; Belladonna; Hematropine; Daturine; etc., are generally used for their local action.

151. *Myotic:—(Netrakashitayoga); (Hind:—Ankh ki putli ko Sakornewali):*—Medicines causing contraction of the pupil and dimunition of ocular tension; e.g., Eserine; Calabar bean; pilocarpine, etc.

152. *Narcotics:—(Nidrakari); (Hind:—Nind lanewali):*—poisonous substances that chiefly influence the brain; drugs that produce unconsciousness or narcosis or stupor or induce sleep by its action on the cerebrum.

Narcotics are also medicines which stupefy and diminish the activity of the nervous system. Given in small doses, they generally act as stimulants, but an increased dose produces a sedative effect. Narcotics are to be distinguished by their initial or preliminary exciting stage from pure Hypnotics like Chloral and Bromide of Potassium, etc.; amongst them are Opium; Morphine; Chloroform; Indian Hemp; Alcohol, Camphor and Ether.

See:—Hypnotics; Soporifics; Anodynes; Sedatives; Somnifacients and cerebral Stimulants.

153. *Nauseant:*—Any agent that produces nausea.

154. *Nervines:*—(*Hind:*—*Rag-o-reshon men bal karnewali*):—Remedies that calm nervous excitement or act favourably on nervous diseases and nervous system. The term includes Narcotics; Anaesthetics; Hypnotics; Excito-motors; etc.

155. *Nutritives or Nutrients:*—*Nourishing* (*Hindi:*—*Ghiza pahun chanawali*) medicines included in tonics and stimulants. E.g.:—Sago; Sugar.

156. *Oxytocics:*—*See:*—*Ecbolics:*—Drugs that hasten child birth by stimulating uterine contractions; e.g., Ergot; Hydrastics; Quinine.

157. *Parasiticide:*—*See:*—"*Antiparasitic*":—(*Krimighna*) (*Hind:*—*Bahar ke kiromarnewali*):—Destructive of parasites,—animal as well as vegetable, which infest the human body. See also Germicides.

158. *Parasitotropics* are ideal disinfectants, which exert a maximum action on the micro-organisms, and a minimum action on the body tissues; these will be soluble in water or will form a uniform emulsion in all proportions, rapid in action and non-corrosive to metals.

159. *Paregorics:*—*See:*—*Sedatives:*—are medicines which actually assuage pain; e.g., Compound tincture of Camphor; Henbane; Hops; Opium.

160. *Parturifacients:*—*See:*—"*Ecbolics*":—*Medicines* or Agents that induce parturition, i.e., giving birth to young.

161. *Pectoral:*—(*Kasahara*):—A medicine useful in diseases of the respiratory tract.

162. *Preservatives:*—Substances added to foodstuffs to inhibit decay.

163. *Prophylactics* are remedies employed to prevent the attack of any particular disease; e.g., Quinine.

164. *Ptyalogogue or Ptysmagogue:*—*See:*—*Sialogogue:*—A medicine which causes salivation.

165. *Purgative:*—(*Virechaneeya*); (*Hind:*—*Kara julab*):—A medicine producing, or increasing or hastening, intestinal (from the bowels) evacuations. See:—Cathartics; Evacuants; Aperients. E.g., Senna; Rhubarb, Jalap; Colocynth; Buckthorn; Aloes; Cream of tartar; Scammony; Calomel; Epsom sals; (Glauber's) salts; Sulphate of Potash; Venice Turpentine.

166. *Pustulant:*—(*Mahalepa*); (*Hind:—Phapoke dal denewali*):—An irritant substance, which does not affect the whole skin alike, but especially irritates isolated portions and gives rise to the formation of pustules.

167. *Refrigerants*:—*See also:—Antipyretics*:—(*Dahanashaka*) (*Hind:—Pias hujhanewali*):—Medicines having cooling properties on the surface of the body, or lowering bodily temperature, and which quench thirst, and medicines which suppress an unnatural heat of the body. These are thus local or internal. E.g., Seville Oranges; Lemons; Tamarinds; Nitre; Cream of Tartar; Vegetable acids; Some Mineral acids (much diluted), and many *Diaphoretics.*

168. *Resolvents:*—(See:—Absorptives; Discutients):—These which cause the absorption of inflammatory or other swellings. These appear to act by stimulating the lymphatics, as Iodine, Ammoniacum, etc.

169. *Restoratives:*—Medicines, cordials, or foods, which exist already in the healthy blood or tissues, and are given in diseases, where the system is supposed to be deficient in them, and would be efficacious in restoring one to health and vigour; E.g., Iron, Potash; Phosphorus, Chloride of Sodium etc. These are identical with Haematinics, (which see).

170. *Revulsive:*—An agent designed to withdraw the blood from or counteract the tendencies toward a morbid focus or process.

171. *Rubefacient*:— (*Bareeyalepana*); *Hind*:— *Lal chakatte dal-denewali*):—*See:—Counter-irritants.* A remedy when externally applied, by irritation of the ends of the nerves of the skin, causes distension of the capillaries, inflammation and reddening of the skin, and increases the blood flow of the part; E.g., Mustard; Cayenne Pepper; Oil of Turpentine: Liquor Ammonia.

172. *Salicylates:*—Any salts of Salicylic acid: E.g., Salicylates of Ammonium; Atropin; Bismuth; Caffein; Cinchodin; Lithium; Methyl; Physostigmin; Quinin; and Sodium etc., have been employed in medicine, especially in rheumatic affections.

173. *Salines:—See:—Laxatives; Purgatives.*

174. *Saponins:*—These are a variety of glucosides which form froth when shaken with water, and which are used to emulsify oils and resins. *Some are very poisonous and are termed Sapotoxins.*

175. *Saporific:*—An agent giving a taste.

176. *Sapotoxins:*—(See:—Saponins). Active proplasmic poisons obtained from Saponins. They are glucosides.

177. *Sclerosing agents* are drugs used for producing inflammation of the endothilial lining of the varices and are therefore largely used in the injection treatment of varicose veins.

178. *Sedatives* :—(*See:—Depressants* ):—(*Shulahara*); (*Hind:—Sulaur jalan dur karnewali*):—Agents that exert a soothing effect by lowering functional activity; drugs which quiet the nervous system without actually producing sleep; E.g., Bromides; Aconite. See:—Cerebro-spinants.

**Sedatives or Depressants** are medicines which depress action of the (1) nervous system, as tobacco; lobelia; Bromide of Potassium; Aconite, etc. (2) the circulatory system, as aconite, veratrum; Prussic Acid, etc. (3) the spinal cord, as Calabar bean, etc.

Sedatives are classified as under:—

(1) Arterial or General. (2) Cardiac. (3) Nervine. (4) Pulmonary or Respiratory. (5) Gastric. (6) Urinary. (7) Uterine.

**Cardiac Sedative:** (Hind:—Hirde ke dard ke dur karnewali).

**Local Sedative:**—(Hindi:—Sul dur karnewala lep).

**Respiratory Sedative:**—(Hindi:—Phepre wa sans ki na liyon ki so zish dui karnewali).

**Nervine Sedative:**—(Hind:—Bai ke tez dardon ko dur karnewali).

**Gastric Sedative:**—Hind:—Khatti dakar wa mede ke dard dur karnewali).

**Arterial Sedatives** are medicines which reduce the vital action of the heart and arteries.

179. *Sialagogue or Ptyalagogue:*—(*Lalavardhaka*); (*Hind:—Ral-barhanewali wa thuk barhanewali*):—Producing or increasing a flow or secretion of spittle or saliva, by exciting the salivary glands, either by a local irritation of the mouth, causing reflex activity of the glands; E.g., Pellitory; Mezereon; Tobacco; Mustard; Capsicum, etc., or by exciting the glands during their elimination, as Pilocarpine; Muscarine; all the preparations of Mercury; Iodide of Potassium etc. These are either local or general.

180. *Somnifacient:* A medicine producing sleep; See:—Hypnotic; Narcotic; Soporific.

181. *Soporific:* (Hind:—Nind lanewali)::—An agent that induces sleep. E.g., Hops.

182. *Sorbefacient:*—An agent that induces absorption.

183. *Spasmodic:*—Pertaining to convulsions or spasms.

184. *Stereoptenes:*—Solid volatile oils.

185. *Sternutatory:— (Chhikkakari): (Hind:— Chhink lanewali; ya nazla bahadenewali):—See:—Errhine.* A drug or compound that causes sneezing by the local irritating action on the nasal mucous membrane; E.g., Tobacco; Hellabore; Ginger; Capsicum; and Ipecacuanha, in powder.

186. *Stimulants:—(Agnisthapaneeya); (Hind:—Uksanewali):*—See also: Counter-irritants. Agents exciting even briefly the normal activity or depressed functions or organic action of any part of the system, or some process of the economy; substances that increase vital energy and the force of the action of heart and circulatory system.

The term "Stimulant" is frequently erroneously used as a synonym for alcohol and its preparations, which are true narcotics. Under this head, may be included a great number of remedial agents. The subdivisions are vague and misleading; thus there are medicines which excite the spinal cord, as Strychnine, Phosphorus, etc., **such are called spinal stimulants**; others exalt the functions of the liver, as Cholagogues; others, the intestines, as Calomel, Epsom Salt, etc.; others the circulatory sysem, as Digitalis, Belladonna etc.; others, the stomach as carminatives and spices etc.; others, the skin. These latter are called external stimulants, and include all the counter-irritants.

(1) **Arterial stimulants**; e.g., Cayenne Pepper; Oil of Turpentine; Phosphorus; Carbonate of Ammonia.

(2) **Cerebral Stimulants or Narcotics**; e.g., Alcohol; Opium; Morphia; Camphor; Stramonium, (leaves, roots, and seeds).

(3) **Nervine or nervous stimulants:**—(Hind:—Nariyon ka bal barhanewali):—exciting nervous system; E.g., Musk; Castoreum; Assafoetida; Caffeine; Strychnine.

(4) **Stomachic Stimulants:**—(Hind:—Mede ke kam ko barhanewali). See:—Aromatics.

(5) **Circulatory Stimulant:**—(Hind:—Khun ki Saliyon men achhi tarah khun bahanewali); E.g. Adrenaline.

(9) **Local Stimulants:**—(Hindi:—Indriyon ke taqat denewali):—Comprise of Laxatives, Emetics; Purgatives; Diuretics; Diaphoretics; Rubefacients; Expectorants; Sialagogues; Epispastics.

(10) **General Stimulants** are sub-divided into two classes:—

(a) Diffusible and (b) Permanent. The first comprising **Narcotics and Antispasmodics**, and the second **Tonics and Astringents.**

187. *Stomachic :—(Kshudhavardhaneeeya) (Hind :—* Bhuk barhanewali). A stimulant increasing or exciting the secretion of gastric juice, functional activity of the stomach, by improving the tone of stomach to promote appetite and digestion. (Included in Stimulants and tonics); E.g., Bitters; Carminatives like Gentian. These are both direct and indirect.

188. *Styptics:—(Rakthasthambana). See:—Haemostatics; (Hind:—Khun band karnewali).* Medicines that cause vascular contraction of the blood vessels or coagulating the

albuminous tissues of the blood, and checks haemorrhage; E.g., Adrenaline; Alum; Iron salts; (perchloride of Iron); Kino; Friar's balsam; Extract of Lead; Ice; Tannic Acid; Chloride of Zinc; Creosote.

189. *Sudorifics* :—*See* :—*"Diaphoretics"* (*Ugrasvedaneeya*); (*Hind:—Bahut zor se pasina lanewali*). Inducing profuse sweating; medicine that moistens the skin; are mild Diaphoretics; E.g., Ipecacuanha; Antimony; Jame's powder; Ammonia.

190. *Taeniacide or Teniacide,* is a drug that destroys tapeworms. *See:—Anthelmintic.*

191. *Terebinthinate:*—Comprising of gums and resins.

192. *Tonics:*—(*Hindi:—Taqat Denewali*):—are strictly speaking medicines, which permanently increase the tone of the part upon which they act, as well as improve the entire general tone of the system, jointly and severally, by stimulating the nutrition. The term is too vague to convey any special meaning. Their operation, in all cases, is general; e.g., Quassia; Gentian; Camomile; Wormwood; Angostura bark. Tonics are classified as:—Of animal origin; pure bitters; bitters peculiar in properties; aromatics and mineral tonics. Thus it may be on the stomach, as the pure vegetable bitters and all stomachics; or, on the cord, as Strychnine; or on the heart, as Digitalis; or on the nervous system, as quinine and the valerianates; or on the muscular tissues, as Tannic acid; or on the circulating fluid, as Iron.

Stomachic tonic: (*Hind:—Khub bhuk laganewali*);

Intestinal tonic: (*Hind:—Ant antariyon ko pusht karnewali*);

Cardiac tonic: (*Hind:*—Dilko taqat denewali);;

, Blood tonic: (*Hind:—Khun barhanewali*).

193. *Tridoshaharam:*—Annihilator of *'Tridosha'* (*Vata, Pitta, and Kapha*).

194. *Vaccines* are sterilised suspensions of organisms, living or dead in normal saline, which, when injected into a man, or animal, provokes formation of immunity or antibody, which directly or indirectly, either destroy the infecting organisms, or neutralise the toxin produced by these organisms.

195. *Vasoconstrictors:*—These are agents, which increase the contraction of the smaller vessels by acting uon their muscular fibres, raising thereby the blood-pressure and lessening circulation; they are used to check haemorrhage and reduce inflammation.

196. *Vaso-dilators*:—Drugs, which produce dilatation of the peripheral vessels, and the arterioles, lower the blood-pressure, and thus relieve the heart, increase circulation and equalise blood-pressure; they are therefore used to relieve internal congestion and also to relieve the embarrassed condition of the heart.

197. *Vermicide.* (Hind:—Kiremarnewali); See also:—Anthelmintics:—That which kills intestinal worms.

198. *Vermifuge*:—(Hind:—Kiremarnewali); See also:—Anthelmintics:—That which *expels* intestinal worms, though it may not have power to cause their death.

199. *Vesicant or Vesicatory; (Teekshnalepana); (Hind: —Dane paida karnewali)*.—A blistering agent or application; E.g. Strong liquid Ammonia.—See:—Epispastics; Counter-irritants.

200. *Vesicatory*:—See:—Vesicant; Epispastic.

201. *Vulnerary*: A remedy useful in healing wounds.

# INDEX—LIST OF PLANTS IN THIS BOOK ARRANGED ACCORDING TO THEIR NATURAL ORDERS:—

*N.B.:—Typical Examples of each Natural Order appear with Asterisk Marks*

## 1. ACANTHACEAE:—

1. *Acanthus ilicifolius, *Linn.* See:—Dilivaria ilicifolia, *Juss.*
2. *Adhatoda Vasica, *Nees.*
3. Andrographis echiodes, *Nees.*
4. *Andrographis paniculata, *Nees.*
5. *Asteracantha longifolia, *Nees.* See:— Hygrophila spinosa, *T. Anders.*
6. Asystasia coromandeliana, *Nees.* See:— A. gangetica.
7. Barleria courtallica, *Nees.*
8. *Barleria cristata, *Linn.* See:— B. dichotoma.
9. Barleria dichotoma. *Roxb.* See:— Barleria cristata.
10. Barleria longiflora, *Linn.* See:— Hygrophila spinosa.
11. Barleria noctiflora, *Linn.*
12. *Barleria prionitis, *Linn.*
13. Barleria strigosa, *Willd.*
14. Blepharis edulis, *Pers.*
15. Blepharis molluginifolia, *Pers.*
16. Daedalacanthus roseus, *T. Anders.*
17. Dicliptera roxburghiana, *Nees.*
18. Dilivaria ilicifolia, *Juss.* See:— Acanthus ilicifolius.
19. Ecbolium elaterium, *A. Rich.*
20. Ecbolium linneanum, *Kurz.* See:— Justicia ecbolium.
21. Gendarussa vulgaris, *Nees.* See:— Justicia gendarussa, *Linn.*
22. Graptophyllum hortense, *Nees.* See:— Graptophyllum pictum; Justicia picta.
23. Graptophyllum pictum, L. *Griff.* See:—Graptophyllum hortense; Justicia picta.
24. Gymnostachyum febrifugum, *Benth.* See:— G. alatum.
25. Haplanthus tentaculatus, *Nees.*
26. Haplanthus verticillaris, *Nees.*
27. Hygrophila obovata.
28. Hygrophila ringens.
29. *Hygrophila spinosa, *T. Anders.* H. longifolia, See:— Astercantha longifolia; Rubia longifolia.
30. Justicia adhatoda, See:— Adhatoda vasica, Adha-

toda bivalvis; Justicia bivalvis.
31. Justicia bivalvis, See:—Adhatoda vasica.
32. Justice ecbolium, See:—Ecbolium linneanum, *Kurz.*
33. *Justicia gendarussa, *Burm, Nees, Linn.* See:— Gendarussa vulgaris.
34. Justicia nasulla, See:—Rhinacanthus commumunis.
35. Justicia paniculata, See:—Andrographis paniculata.
36. Justicia picta, *Linn.* & *Roxb.* See:—Adhatoda vasica; Graptophyllum pictum & G. hortense.
37. Justicia procumbens, *Linn.*
38. Justicia repens, See:—Rumgia repens.
39. Justicia Tranquebariensis.
40. Justicia zeylonsesium.
41. *Lepidagathis cristata, *Willd & Wight.*
42. Neuracanthus lawii, *Wight.* See:—Neuracanthus sphaerostachyus.
43. Neuracanthus Sphaerostachyus, *Dalz.* See:—N. lawii.
44. Peristrophe bicalyculata, *Nees.*
45. Phlogacanthus thyrsiflorus, *Nees.*
46. Rhinacanthus communis, *Nees.* See:—Justicia nasulla, R. nasuta.
47. *Ruellia prostrata, var:—dejecta.
48. Ruellia suffruticosa, *Roxb.*
49. Rungia parviflora, *Nees.* See:—R. pectinata.
50. *Rungia repens, *Nees & Wight.* See: — Justicia repens.
51. Strobilanthes auriculatus, *Nees.*
52. Strobilanthes Callosus, *Nees.* See:—S. grahamianus, *Wight.*
53. Strobilanthes ciliatus, *Nees.* See:—S. callosus.

---

## 2. AIZOACEAE.

1. Mollugo lotoides, *O. kze.*

---

## 3. ALANGIACEAE.

1. Alangium lamarkii, *Thwaites.*

---

## 4. ALGAE.

1. Chlondrus crispus, *Lyngbye.*
2. Fucus distichus, *Linn.*
3. Fucus nodosus, *Linn.*
4. Fucus vesiculosus, *Linn.* same as F. distichus.
5. Gelidium cartilagineum, *Gaill.* See:—Gracilaria lichenoides; Ficus or Fucus vesiculosus; Luminaria digilara.
6. *Gracilaria lichenoides, *Grev.* See:—Gelidium cartilagineum; Luminaria digilara.
7. Luminaria saccharina. *Lam,* & *L.* Digitata & L. potatorium.

Gaertn. Hypoxis orchioides.
16. Hypoxis orchioides, *Kurz.* See:—Hypoxis brevifolia, *Kurz.* Curculigo orchioides.
17. Narcissus tazetta, *Linn.*
18. *Polianthes tuberosa, *Linn.*

---

## 8. ANACARDIACEAE.

1. *Anacardium occidentale, *Linn.*
2. Buchanania augustifolia, *Roxb.*
3. Buchanania lancifolia.
4. Buchanania lanzan, *Spreng.* See:—B. latifolia.
5. Buchanania lotifolia, *Roxb.* See:—B. lanzan; Spondias elliptica.
5a. Cassuvium pomiferum, *Lam.*
5b. Chironji sapida.
6. Holigarna arnottiana, *Hook.* See:—H. longifolia.
7. Holigarna longifolia, *W. & A.*, & *Roxb.* See:—H. arnottiana.
8. Holigarna nigra, *Bourd.*
9. Mangifera domestica. See:—Mangifera indica; Mangifera montana.
10. *Mangifera indica, *Linn.* M. montana; M. domestica.
11. Mangifera montana. See:- Mangifera indica; Mangifera domestica.
fera domestica.
12. Mangifera sylvatica.
13. Melanorrhoea usitata, *Wall.*
14. Nothopegia colebrookiana, *Bl.* See:—N. heyneara, *Gamble.*
15. Nothopegia heyneara, *Gamble.*
16. *Odina woodier, *Roxb.* See:—Rhus odina; Lannea grandis.
17. Pistacia cabulica, See:—Pistacia khinjuk; Pistacia mutica; Pistacia terebinthus.
18. Pistacia integerrima, *Stewart.* See:—P. kinjuk; Rhus succedania; Rhus kakra singee.
19. Pistacia khinjuk, *Stocks.* See:—Pistacia cabulica; Pistacia mutica; Pistacia terebinthus; Pistacia integerrima. Rhus kukra singee; R. succedania.
20. Pistacia lentiscus, *Linn.*
21. Pistacia mutica, See:—Pistacia terebinthus, *Linn.* Pistacia cabulica. Pistacia khinjuk.
22. Pistacia terebinthus, *Linn.* See:—Pistacia mutica; P. cabulica; P. khinjuk.
23. Pistacia vera, *Linn.*
24. Rhus coriaria, *Linn.*
25. Rhus insignis, *Hook.*
26. Rhus kakrasingi or kakrasingee *Royle.* See:—Pistacia integerrima.
27. Rhus odina, See:—Odina woodier; Lannea grandis.
28. Rhus parviflora, *Roxb.*
29. Rhus semi-alata, *Morr.*
30. Rhus succedanea, *Linn.* Similar to Pistacea integerrima; R. acuminata.
31. Rhus wallichii, *Hook.*
32. *Semecarpus anacardium, *Linn.*
33. Spondias acuminata.
34. Spondias ekminut; See:—Spondias mangifera.

## 9. ANNONACEAE, or ANONACEAE.



## 10. APOCYNACEAE.

21. *Holarrhena antidysenterica, *Wall.* See:—H. pubescens; Chonomorha antidysenterica; Echites antidysenterica.
22. Holarrhena pubescens, See:—Hollarrhena antidysentirica. Chenomorha antidysentirica.
23. Hunteria corymbosa, *Roxb.*
24. Ichnocarpus frutescens, *R. Br.* Similar to Hemidesmus indica. See:—Apocymene frutescens; Echites, frutescens; Asclepias pseudosarsa var. latifolia; Smilax chinensis or China.
25. Kopsia flavida, *Blume.*
26. Leuconotis eugenifolia, *Dc.*
27. Melodinus monogynus, *Roxb.*
28. Nerium antidysentericam or cum.
29. Nerium devaricatum. See:— Tabernamontana coronaria, *Br.* T. heyneana.
30. *Nerium odorum, *Soland.* See:—N. oleander; Thevetia nerifolia.
31. Nerium psidium, See:—Nerium odorum; Thevetia nerifolia; Cerebera thevetia.
32. Nerium tinctorium, See:—Wrighti tinctoria.
33. Nerium tomentosum, *Roxb.*
34. Ophioxylon serpentinum, *Linn.* See:—Rauwolfia serpentina.
35. Parsonsia spiralis, *Wall.* See:—Heligme rheedei.
36. Plumeria acuminata. See:—P. alba & P. acutifolia.
37. *Plumeria acutifolia, *Poir,* See:—Plumeria acuminata.
38. Plumeria alba, *Linn.*
39. *Rauwolfia serpentina, *Benth.* See:—Ophioxylon serpentinum, *Linn.*
40. Rhazya stricta, *DC.*
41. Strophanthus dichotomus, *DC.*
42. Tabernaemontana coronaria, *Br.* & *Willd.* See:—Nerium devaricatum; T. heyneana; Ervatamia coronaria, *Stapf.*
43. Tabernamontana crispa.
44. Tabernamontana dichotoma, *Roxb.* See:—Ervatamia dichotoma, *Roxb.*
45. Tabernamontana heyneana, *Wall.* Use similar to T. coronaria, *Willd.* See:—Ervatamia heyneana, *T. cooke.*
46. Tabernaemontana sphaerocarpa, *Blume.*
47. Tabernaemontana wallichiana, *Steud.*
48. *Thevetia neriifolia, *Juss.* See:—Cerbera thevatia, *Don.* Nerium odorum, *Soland.*
49. Trachelospermum fragrans, *Hook.*
50. Vallaris heynei, *Spreng.* See:—Echites dichotoma; V. solanacea.
51. Vallaris pergulana, *Burm.*
52. Vinca pusilla, *Murr.* See:—Lochnera pusilla.
53. *Vinca rosea, *Linn.* See:—Lochnera rosea.

54. Wrightia antidysenterica, *Grah.* See:—Holarrhena antidysenterica, *Wall.*

55. *Wrightia tinctoria, *R. Br.* See:—Nerium tinctorium; W. rothii.

56. *Wrightia tomentosa, *Roem & Schult.* See:—Nerium tomentosa.

## 11. ARACEAE, also known as AROIDACEAE

1. *Acorus calamus, *Linn.* or A. odoratus. See:—Calamus aromaticus asiaticus.
2. Alocasia indica, *Schott.* See:—A. montana; Arum indicum.
3. Alocasia macrorrhiza, *Schott.* See:—A. odorum.
4. *Amorphophallus campanulatus, *Roxb.* or Blume. or A. sylvaticus.
5. Arisaema curvatum, *Kunth.* See:—A. tortuosum.
6. Arisaema leschenaultii, *Blume.*
7. Arisaema murray, *(Graham). Hook.*
8. Arisaema speciosum, *Mart.*
9. Arisaema tortuosum, *Schott.* See:—A. curvatum; Arum tortuosum.
10. Arum campanulatus. See:— Amorphophallus campanulatus.
11. Arum colocasia.
12. Arum indicum, *Roxb.* See:—Alocasia indica.
13. *Colocasia antiquorum, *Schott.* See:—C. esculenta; Arum colocasia.
14. Colocasia indica, See:—Alocasia indica.
15. Colocasia macrorrhiza, *Schott.*
16. Colocasia virosa, *Kunth.*
17. Homalomena aromatica, *Schott.* See:—Asclepias annularis.
18. Lagenandra toxicaria, *Dalz.* See:—L. ovata.
19. Lasia spinosa, *Thwaites.*
20. Plesmonium margaritiferum, *Schott.* See:—Arum margaritifera.
21. Pothos officinalis, See:—Scindapsus officinalis, *Schott.* Piper chaba.
22. *Pothos scandens, *Linn.*
23. Ramusatia vivipara, *Schott.* See:—Arum viviparum.
24. Rhaphidophora pertusa, *Schott.* See:—Pothos pertusa & Scindapsus pertusus.
25. Sauromatum guttatum *Schott.*
26. Sauromatum pedatum, *Schott.*
27. Scindapsus officinalis, *Schott.* See:—Pathos officinalis; Piper chuba. Piper officinarum.
28. Synantherias sylvatica, *Schott.* See:—Arum sylvaticum.
29. Typhonium trilobatum, *Linn & Schott.* See:—T. orixenze.

## 12. ARALIACEAE.

1. Aralia pseudo-ginseng, *Benth.* See:—Panax pseudo-ginseng.
2. Arthrophyllum blumeanum, *Zoll. & Mor.*

3. Hedera helix. *Linn.*
4. Panax fruticosum. *Linn.* See:—Nothopanax fruticosum, *Miq.*

## 13. ARISTOLOCHIACEAE

1. *Aristolochia bracteata, *Retz.*
2. *Aristolochia indica, *Linn.*
3. Aristolochia longa, *Linn.*
4. Aristolochia rotunda, *Linn.*
5. Aristolochia roxburghiana *Klotz.* See:—A. Tagala.
6. Aristolochia serpentaria, *Linn.*
7. Asarum europoeum, *Linn.*
8. Bragantia tomentosa, *Blume.*
9. Bragantia wallichii, *R. Br.*

## 14. AROIDEAE.

1. Dracontium polyphyllum, *Linn.*

## 15. ASCLEPIADACEAE.

1. Asclepias annularis, See:—Holostemma rheedii, *Wall.*
2. Asclepias asthmatica.
3. Asclepias curassavica, *Linn.*
4. Asclepias echinata, See:—Daemia extensa.
4a. Asclepias gigentia, *Willd.*
5. Asclepias pseudosarasa var., latifolia. See:—Hemidesmus indicus.
6. Boucerosia auchoriana, *Dcne.*
7. Boucerosia umbellata, *W. & A.*
8. *Calotropis gigantea, *R. Br.* and C. procera, *R. Br.* See:—Asclepias gigantea.
9. Calotropis procera, *R. Br.*
10. Ceropegia bulbosa, *Roxb.* C. acuminata, C. tuberosa.
11. *Ceropegia tuberosa, *Roxb*
12. Cosmostigma racemosum, *Wight.*
13. *Cryptostegia grandiflora, *R. Br.*
14. Cynanthum or Cynanchum ipecacuanha, or C. vomitorum, See:—Asclepias asthmatica.
15. Cynanthum or Cynanchum vomitorum. See:—Cynanchum ipecacuanha. Cynanchum Asclepias asthmatica.
16. *Daemia extensa, *R. Br.* See:—Pergularia extensa or Asclepias echinata.
17. Dregea volubilis, *Benth.* See:—Marsdenia volubilis.
18. Gymnema aurantiacum.
19. Gymnema balsamicum, See:—Pluchea indica, *Less.*
20. Gymnema lactiferum.
21. Gymnema latifolium, *Wall.*
22. Gymnema spartum. See:-leptadenia spartum.
23. Gymnema Sylvestre. *R. Br.* or Asclepias geminata.
24. *Hemidesmus indicus, *R. Br.* or Asclepias pseudosarsa, var. latifolia, See:—Smilax chinenensis or Smilax china.
25. *Holostemma rheedii, *Wall.* See:—Asclepias annularis.

3. Bignonia xylocarpa or xylocarpum. See:—Radermachera xylocarpa. Stereospermum xylocarpum, *Benth, Wight, & Hook.*
4. Crescentia cujete, *Kinn.*
5. *Dolichandrone falcata, *Seem.*
6. Dolichandrone stipulata, *Benth.*
7. Heterophragma chelonoides, See:—Heterophragma suaveolens, Bignonia suaveolens. Bignonia chelonoides. Stereospermum suaveolens.
8. *Heterophragma roxburghii. *DC.* See:—Bignonia quadrilocularis.
9. Heterophragma suaveolens, Heterophragma chelonoides. See:—Bignonia suaveolens, Bignonia chelonoides, Stereospermum suaveolens, *DC.*
10. Heylandia latebrosa, *DC.*
11. *Oroxylon or Oroxylum indicum, *Vent.* See:—Colosanthes indica, or Bignonia indica.
12. *Stereospermum chelonoides, *C. B. Clarke.* See:—S. tetragonum.
13. * Stereospermum suaveolens. See:—Stereospermum chelonoides. Heterophragma suaveolens, Heterophragma chelonoides, or Bignonia suaveolens or Bignonia chelonoides.
14. Stereospermum xylocarpum, *Benth, Hook & Wight.* See: —Radermachera xylocarpal, Bignonia xylocarpal or Bignonia xylocarpum.
15. Tecoma undulata, *G. Don.* See:—Tecomella undulata, *Seem.*

## 22. BIXACEAE.

1. *Bixa orellana, *Linn.*

## 23. BIXINEAE.

1. Asteriastigma macrocarpa, *Bedd.*

## 24. BOMBACACEAE.

1. Adansonia digitata, *Linn.* See:—Baobabus digitata.
2. Bombax heptaphylla, See:—Bombax malabarica.
3. *Bombax malabaricum, *DC.* See:—Bombax heptaphylla, Bombax ceiba.
4. Bombax pentadrum, *Linn.* See:—Ceiba pantandra; Eriodendron fractuosum.
5. *Eriodendron anfractuosum, *DC.* See:—1. Ceiba pentamra; 2. Bombax ceiba. 3. Bombax pentandrum.

## 25. BORAGINACEAE or BORAGINEAE.

1. Borago officinalis, *Linn.* or Borrago officinalis.
2. Caccinia glaues, *Savi.*
3. Cissus quadrangularis, See:—Cissus edulis. Lycopodium imbricatum. Heliotropium indicum, *Linn.*
4. *Coldenia procumbens, *Linn.*
5. Cordia angustifolia, *Don.*

## 26. BROMELIACEAE.



## 27. BURSERACEAE.

4. Balsamodendron myrrha, *Nees.*
5. Balsamodendron opobalsamum, *Kunth./*
6. Balsamodendron playfairii, *Hook.*
7. Balsamodendron pubescens, *Stocks.* See:—B. mukul; Commiphora stocksiana.
8. Balsamodendron roxburghii, *Stocks.* See:—Commiphora mukul.
9. Balsamodendron zeylanicum, See:—Canarium commune.
10. Boswellia glabra, *Roxb.* Boswellia thurifera, Boswellia serrata, Roxb. See:—Olibanus thurifera.
11. Boswellia serrata, *Roxb.*
12. Boswellia thurifera or thuriferia? *Cole.*
13. Canarium bengalense, *Roxb.*
14. Canarium commune, *Linn.* or (Amyridaceae or Simarubaceae.) See:—Balsamodendron zeylanicum.
15. Canarium pimeta, *Koen.*
16. Canarium strictum, *Roxb.*
17. Commiphora mukul, Engl. or Commiphora africana. See:—Balsamodendron mukul. Balsamodendron roxburghii.
18. Commiphora myrrha, See:— Balsamodendron myrrha.
19. Garuga pinnata, *Roxb.*

## 28. CACTACEAE.

1. Cactus indicus, See:—opuntia dillenii, *Haw.*
2. Opuntia dillenii, *Haw.* See:—cactus indicus.

## 29. CAESALPINEAE or CAESALPINIACEAE or CAESALPINIOIDEAE.

1. Bauhinia macrostachya, *Wall.* See:—Bauhinia scandens.
2. *Bauhinia purpurea, *Linn.*
3. Bauhinia purpurosa, See:—Bauhinia variegata.
4. *Bauhinia racemosa, *Lam.* See:—Bauhinia variegata.

4a. Bauhinia retusa, *Ham & Roxb.*

5. Bauhinia tomentosa, *Linn.*
6. Bauhinia vahlii, *W. & A.*
7. *Bauhinia variegata, *Linn.* See:—Phanera variegata.
8. Caesalpinia bonduc, *Roxb.* or *Baker?* See:—C. jayabo.
9. *Caesalpinia bonducella, *Fleming.* See:—Guilandina bonducella, C. crista.
10. *Caesalpinia coriaria, *Willd.*
11. Caesalpinia digyna, *Rottl.* or C. oleosperma.
12. Caesalpinia nuga, *Ait.*
13. *Caesalpinia pulcherrima, *Swartz.*
14. Caesalpinia sappan, *Linn.*
15. Cassia absus, *Linn.*
16. Cassia acutifolia, or Cassia angustifolia, See:—Cassia lanceolata.
17. Cassia alata, *Linn,* or C. herpetica; Cassia bracteata, See:—Senna alata.
18. Cassia angustifolia, *Vahl.* See:—Cassia lanceolata, *Linn.* Senna officinalis.

## 30. CAMPANULACEAE.



## 31. CAPPARIDACEAE.

9. *Capparis zeylanica, *Linn.* See:—Capparis horrida.
10. Cleome chelidonii, *Linn.*
11. Cleome dodecandra,
12. Cleome felina, *Linn.* See: Polanisia felina.
13. Cleome pentaphylla, *Linn.* See:—Gynandropsis gynandra.
14. *Cleome viscosa, *Linn.* or Cleome icosandra; See:—Polanisia viscosa, *D.C.* Polanisia icosandra.
15. Crataeva marmelos, See:—Aegle marmelos.
16. *Crataeva nurvala, *Ham.* or Crataeva religiosa.
17. *Crataeva religiosa, *Hook & Forst.* See:—Crataeva nurrala; Crataeva roxburghii.
18. Crataeva roxburghii. See:—Crataeva religiosa.
19. *Gynandropsis pentaphylla, *DC.* See:—Gynandropsis gynandra.
20. Maerua arenaria, *Hook.* See:—Maerua ovalifolia, Niebuhria oblongifolia, Royle; & Capparis heteroclita.
21. Polanisia icosandra, *See:*—Cleome viscosa.
22. Polanesia viscosa, *DC.* See:—Cleome viscosa.

## 32. CAPRIFOLIACEAE.

1. Lonicera glauca, *Hk. f. & T.*
2. Sambucus ebulus, *Linn.*
3. Sambulus nigra, *Linn.*
4. Viburnam foetidum, *Wall.*

## 33. CARICACEAE.

1. Carica papaya, *Linn.*

## 34. CARYOPHLLACEAE.

1. Cerastium glomeratum.
2. Cerastium indicum, *Thuill.*
3. Drynaria cordata, *Willd.*
4. *Polycarpoea corymbosa, *Lamk.*
5. Saponaria vaccaria, *Linn.* See:—Gypsophila vaccaria & Saponaria perfoliata.

## 35. CASUARINACEAE.

1. Casuarina equisetifolia, *Forst.*

## 36. CELASTRACEAE.

1. Celastrus montana. See:—Celastrus paniculata.
2. Celastrus multiflora, See:—Celastrus paniculata, *Willd.*
3. Celastrus nutans, See:—Celastrus paniculatus.
4. Celastrus paniculata, *Willd.* See:— Celastrus montana; Celastrus multiflora; & Celastrus nutans.
5. Celastrus Senegalensis, *Lam.*
6. Celastrus spinosa, *Royle.* See:—Gypnosporia royleana.
7. Elaeodendron glaucum, *Pers.* See:— Elaeodendron roxburghii; Elaeodendron panuculatum?
8. Elaeodendron paniculatum. See:—Elaeodendron glaucum. *Pers.*
9. Elaeodendron roxburghii, *W. & A.* See:—Elaeodendron glaucum.

## 37. CELASTRINEAE.



## 38. CHENOPODIACEAE.



## 39. CHLORANTHACEAE.



## 40. COCHLOSPERMACEAE.



## 41. COLCHICACEAE.

Colchicum luteum; & Colchicum a u tumnale; Iris tuberosa.

## 42. COMBRETACEAE.

1. *Anogeissus latifolia, *Wall.* See:—Conocarpus latifolius.
2. Calycopteris floribunda, *Lamk.* See:— Combretum extensum.
3. Combretum extensum, See:—Colycopterus floribunda.
4. Combretum p i l o s u m, *Roxb.*
5. Conocarpus latifolia, or latifolius? *Roxb.* See:— Anogeisus latifolia.
6. Pentaptera angustifolia, See:—Terminalia arjuna, *W. & A.*
7. Pentaptera glabra, See:— Terminalia arjuna, *W. & A.*
8. *Quisqualis indica, *Linn.* See:—Quisqualis villosa.
9. Quisqualis villosa, See:— Quisqualis indica, *Linn.*
10. Syzygium jambolanum, *DC.* See:—Eugenia jambolana; Psidium guyava, *Linn.* Jambosa vulgaris, Pyrus communis, *Linn.* Psidium pyriferum; & Psidium pomiferum.
11. Terminalia alata, See:— Terminalia crenu l a t a; Terminalia glabra; Terminalia tomentosa, *Bedd.* Pentaptera tomen t o s a; Terminalia typica; & Terminalia ceriacea.
12. *Terminalia arjuna, W. & *A.* See:—Pentaptera glabra; Pentaptera angustifolia, & Pentaptera arjuna.
13. *Terminalia belerica, *Roxb*
14. Perminalia catappa, *Linn.* See:—Perminalia myrobalans.
15. *Terminalia chebula, *Retz.* & *Roxb.* See:—Terminalia reticulata.
16. Terminalia citrina, *Roxb.* & *Fleming.*
17. Terminalia crenulata, See:—Terminalia tomentosa; Terminalia glabra; Terminalia alata; & Pentaptera tomentosa.
18. Terminalia glabra, See:— Terminalia tomentosa, *Bedd.* Terminalia crenulata; Pentaptera tomentosa; Terminalia typica; & Terminalia coriacea. Terminalia alata.
19. *Terminalia paniculata, *Roth.* See:—Pentaptera Paniculata.
20. Terminalia reticulata, See:—Terminalia chebula, *Retz. Roxb.*
21. *Terminalia tomentosa, *W.* & *A.* & Var:—Typica; coriacea (Bedd.) See:— T. crenulata; T. glabra, T. alata; Pentaptera tomentosa.

## 43. COMMELINACEAE.

1. Aneilema nudiflorum, *R. B.*
2. Aneilema scapiflorum, *Wight.*
3. Aneilema spiratum, *R. Br.*
4. Commelina benghalensis, *Linn.* See:—Commelina

nudiflora, *Linn.* Commelina obliqua, *Ham.*
5. Commelina nudiflora, *Linn.*
6. Commelina obliqua, *Ham.*
7. Commelina salicifolia, *Roxb.*
8. Commelina suffruticosa, *Bl.*
9. Cyanotis axillaris, *Schultes.* See:—Tradescantia axillaris, *Linn.*
10. Cyanotis cucullata, *Kunth.*
11. Cyanotis tuberosa, *Schultes.*
12. Tradescautia or Pradescantia axillaris, *Linn.* See:—Cyanotis axillaris, *Schultes.*

## 44. COMPOSITAE.

1. Absinthium officinalis, or Absinthium vulgaris. See—Artemesia absinthium.
2. Acanthospermum hispidum, *DC.*
3. Achilliea millefolium, *Linn.*
4. *Ageratum conyzoides, *Linn.*
5. Anacyclus pyrethrum, *DC.* See:—Pyrethri radix.
6. Anaphalis neelgerriana, *DC.*
7. Anthemis nobilis, *Linn.*
8. Aplotaxis auriculata, *DC.* See:—Saussuria auriculata.
9. Aplotaxis or Heplotaxis auricula? Aplotaxis or Heplotaxis lappa?
10. Arnica montana; *Linn.*
11. Artemisia absinthium, *Linn.* or Artemisia vulgaris, or Artemisia indica; Artemisia paniculata; Absinthium vulgare.
12. Artemisia maderaspatana, See:—Grangea adansonia; & Grangea maderaspatana.
13. Artemisia maritima, *Linn.* or Artemisia brevifolia, *Wall.*
14. Artemisia parsica, *Boiss.*
15. Artemisia sacrorum, *Ledeb.*
16. Artemisia scoparia, *Waldst.*
17. Artemisia siversiana, *Willd.*
18. Artemisia amgdalinay, *Dcne.* Artemisia campbelli, *Hk. f.* Artemisia caruifolia, *Ham.* Artemisia desertorum, *Sprong.* Artemisia dracunculus, *Linn.* Artemisia macrocephala, *Jacq.* Artemisia minor, *Jacq.* Artemisia mollissima, *D. Don.* Artemisia moorcraftiana, *Wall.* Artemisia parviflora, *Roxb.* Artemisia roxburghiana, *Bess.* Artemisia royleana, *DC.* Artemisia salsolides, *Willd.* Artemisia stracheyi, *Hk. f.* Artemisia stricta, Edgew. Artemisia tournefortiana, *Rehb.* Artemisia vestita, *Wall.*
19. *Artemisia vulgaris, *Linn.*
20. Ascaradia indica. See:—Vernonia anthelmintica. *Willd.* Conyza ascaradia. Serratula anthelmintica.
21. Aster trinervius, *Roxb.*

22. Bidens trifida, *Buch*. Bignonia grandiflora, *Willd*. Biophytum sensitivum, *DC*.
23. Blumea amplectens, *DC*.
24. Blumea balsamifera, *DC* & Blumea densiflora.
25. Blumea bifoliata, *DC*. & Blumea densiflora.
26. Blumea densiflora, *DC*.
27. Blumea eriantha, *DC*.
28. Blumea lacera, *DC*. & Blumea aurita.
29. *Blumea wightiana, *DC*.
30. Calandula officinalis, *Linn*.
31. Carduus nutans, *Linn*.
32. *Carthamus tinctorius, *Linn*.
33. Centaurea behen, *Linn*.
34. Centaurea cyanus, *Linn*.
35. Centipeda orbicularis, *Lour*. See:—Artemisia sternutatoria; Dicrocephala. or A. ptarmica.
36. Chrysanthemum coronarium, *Linn*.
37. *Chrysanthemum indicum, *Linn*. See:—Pyrethrum indicum, *DC*.
38. *Cichorium endivia, *Linn*.
39. *Cichorium intybus, *Linn*.
40. Cirsium arvense, *Scop*.
41. Conyza cinerea, See:—Conyza purpurea. Vernonia cinerea, *Less*.
42. Conyza purpurea, See:—Conyza cinerea. Vernonia cinerea, *Less*.
43. Cotula anthemoides, *Linn*.
44. *Cynara scolymus, See:—Asclepias asthmatica.
45. Dicoma tomentosa, *Cass*.
46. Dolomaea macrocephala, *DC*.
47. Doronicum hookeri, *Clarke*.
48. Doronicum pardilianches, *Linn*.
49. Doronicum roylei, *DC*. See:—D. hookeri.
50. *Echinops echinatus, *DC*. & *Roxb*.
51. *Eclipta alba, *Hasek*. See:—Eclipta erecta.
52. *Eclipta erecta, *Linn*. See:—Eclipta alba. Eclipta prostata. See:—Verbesina calendulacea.
53. Eclipta prostrata, *Roxb*. See:—Verbesina calendulacea.
54. *Elephantopus scaber, *Linn*.
55. *Emilia sonchifolia, *DC*.
56. Enhydra fluctuans, *Lour*. See:—Hingtsha repens.
57. Erigeron asteroides, *Roxb*.
58. Erigeron canadensis, *Linn*. See:—Erigeron viscosum.
59. Erigeron viscosum, See:—Erigeron canadensis.
60. Eupatorium aromaticus, See:—Eupatorium ayapana.
61. Eupatorium ayapana, *DC*. See:—Eupatorium triplinerve; Eupatorium perfoliatum; & Eupatorium aromaticus.
62. Eupatorium cannabinum. *Linn*.
63. Eupatorium perfoliatum, See:—Eupatorium ayapana.
64. Eupatorium triplinerve, *Vahl*. See:—Eupatorium ayapana.

102. Pyrethrum umbelliferum, *Boiss.*
103. Rhynchospermum verticillatum, *Rein.*
104. Saussurea candicans, *Clarke.*
105. Saussurea hypoleuca, *Spreng.* See:—Saussurea lappa, *Clarke* & Haploraxis auricula.
106. Saussurea lappa, *Clarke.* See:—Saussurea auriculata, or Aplotaxis lappa, or Aplotaxis auriculata; Aucklandia costs; & Haplotaxis auricula.
107. Saussurea obvallata, *Wall.*
108. Senecio densiflorus, *Wall.*
109. Senecio jacoboea, *Don.*
110. Senecio jacquemontianus, *Benth.*
111. Senecio laciniosus, *Wall.*
112. Senecio quinquelobus, *Hook.*
113. Senecio tenuifolius, *Burm.* See:—Doronicum tenufolium.
114. Senecio vulgaris, *Linn.*
115. Serratula anthelmintica, *Roxb.* See:—Vernonia anthelmintica. Ascardia indica. Conyza ascaradia.
116. Siegesbeckia brachiata, *Roxb.* See:—Siegesbeckia orientalis, *Linn.*
117. Siegesbeckia orientalis, *Linn.*
118. Silybum marianum, *Linn. & Gaertn.*
119. Solidago virga-surea, *Linn.*
120. Sonchus arvensis, *Linn.* See:—Sonchus orixensis, & S. wightianus.
121. *Sonchus oleraceus, *Linn.*
122. Sonchus orixensis, See:-Sonchus arvensis.
123. Sphaeranthus amaranthoides, *Burm.*
124. Sphaeranthus hirtus, See:—Sphaeranthus indicus; Sphaeranthus molis.
125. *Sphaeranthus indicus, *Linn.* See:—Sphaeranthus hirtus.
126. Sphaeranthus microcephalus, See:—Sphaeranthus laevigatus.
127. Sphaeranthus suaveolens.
128. Spilanthes acmella, *Murr. or Linn.* Var:—oleracea, *C. B. Clarke.*
129. Spilanthes calva or salva. See:—Spilanthus oleracea; Spilanthus paniculata; Spilanthus acmellas.
130. Spilanthes oleracea, *C.B. Clarke & Jacq.* See:—Spilanthes salva or calva; Spilanthes acmella; Spilanthes paniculata.
131. Spilanthes paniculata; See:—Spilanthes oleracea; Spilanthes calva or salva?
132. Tagetes erecta, *Linn.*
133. Taraxacum densleonis, *Linn.* See:—Taraxacum officinale.
134. *Taraxacum officinale. *Weber* in *Wigg.* See:—Taraxacum densleonis, *Linn.*

## 45. CONIFERAE.



## 46. CONNARACEAE.



## 47. CONVOLVULACEAE.

4. Convolvulus argentens, & Convolvulus nervosus, or Convolvulus speciosa. See:—Argyreia speciosa.
5. Convolvulus arvensis, *Linn.*
6. Convolvulus paniculata, See:—Ipomoea digitata.
7. Convolvulus scammonia.
8. Cressa cretica, *Linn.*
9. Cuscuta chenensis, *Lamk.*
10. *Cuscuta reflexa, *Roxb.*
11. Erycibe paniculata, *Roxb.*
12. *Evolvulus alsinoides, *Wall. & Linn.*
13. Evolvulus hirsutus, See:—Evolvulus alsinoides, *Wall & Linn.*
14. *Ipomoea acquatica, *Forex.* See:—Ipomoea reptans.
15. *Ipomoea batatas, *Poir & Lamk.* See:—Ipomoea edulis.
16. *Ipomoea biloba *Forsk.* See:—Ipomoea pescaprae. Convolvulus pescaprae.
17. Ipomoea bona-nox *Linn.* See:—Calonyction bona-nox. *Bajer.*
18. Ipomoea brasiliensis, See:—Ipomoea biloba; Convolvulus prescapre.
19. Ipomoea caerulea.
20. Ipomoea campanulata, *Linn.*
21. Ipomoea cymosa, *Roem.*
22. Ipomoea dasysperma, *Jacq.*
23. Ipomoea digitata, *Linn.* See:—Ipomoea paniculata.
24. Ipomoea dissecta, *Willd.* See:—Ipomoea eriocarpa, *Br.* Ipomoea fastigata, *Sweet.* Ipomoea hederacea, *Jacq.*
25. Ipomoea edulis. See:—Ipomoea batatas.
26. Ipomoea eriocarpa, *R. Br.* See:—Ipomoea hispida.
27. Ipomoea fastigata.
28. Ipomoea hederacea, *Jacq.* Ipomoea nil. or Pharbitis nil. Convolvulus nil.
29. Ipomoea muricata, *Jacq.* See:—Ipomoea purga. Calonyction muricatum.
30. Ipomoea nil. See:—Ipomoea hederacea. Ipomoea nil. Convolvulus nil. Pharbitis nil.
31. Ipomoea paniculata. See:—Ipomoea digitata, *Linn.*
32. Ipomoea pescaprae, *SW.* See:—Ipomoea biloba; Ipomoea brasibensis; Convolvulus pescaprae.
33. Ipomoea pes-tigrides, *Linn.*
34. Ipomoea quamoclit, *Linn.* See:—Quamoclit vulgaris; Quamoclit pinnata.
35. Ipomoea reniformis, *Chois.* See:—Merremia emarginata.
36. Ipomoea sepiaria, *Koen.*
37. Ipomoea sinuata, *Ort.*
38. Ipomoea tridentate, *Roth.* See:—Merremia tridentata.
39. *Ipomoea turpenthum, *R. Br.* See:—Operculina turpethum, *Silva.*
40. Ipomoea uniflora, *Roem.*
41. Ipomoea vitifolia, *Sw.* See:—Merremia vitifolia.
42. Lettsomia mysorensis, *Clarke.* See:—Lettsomia aggregata.

23. Raphanus caudatus, *Alef.*
24. *Raphanus sativus, *Linn.*
25. Sinapis alba. See:—Brassica alba.
26. Sinapis cuneifolia, See:—Sinapis juncea; Sinapis nigra; Sinapis ramosa; & Sinapis rugosa.
27. Sinapis dichotoma, *Roxb.* See:—Sinapis glauca; Brassica napus.
28. Sinapis glauca, See:—Sinapis dichotoma; Brassica napus.
29. Sinapis juncea. See:—Brassica juncea. Sinapis nigra; Sinapis ramosa; Sinapis cuneifolia; & Sinapis rugosa.
30. Sinapis nigra, *Linn.* See:—Sinapis juncea; Sinapis ramosa; Sinapis cuneifolia; Sinapis rugosa. Brassica integrifolia & allied plants.
31. Sinapis ramosa, See:—*Sinapis juncea; Sinapis nigra; Sinapis cuneifolia; Sinapis rugosa.
32. Sinapis rugosa, *Roxb.* See:—Sinapis nigra; Sinapis juncea; Sinapis ramosa; Sinapis cuneifolia. Brassica cernua.
33. Sisymbrium irio or iris, *Linn.* See:—Sisymbrium zinn. Sisymbrium sophor.
34. Sisymbrium nasturtium.
35. Sisymbrium sophia, *Linn.* See:—Sisymbrium irio or iris. Sisymbrium zinn. Descurainia sophia.
36. Sisymbrium zinn. See:—Sisymbrium iris, or irio Sisymbrium sophia.

## 52. CUCURBITACEAE.

1. *Benincasa cerifera, *Savi.* See:—Benincasa hispida.
2. Blastania garcini, *Cogn.* See:—Ctenolepis garcini.
3. Bryonia callosa, *Rottl.*
4. Bryonia epigoea, *Wight & Rottla.* See:—Corallocarpus epigeous.
5. *Bryonia laciniosa, *Linn.* See:—Bryonopsis lacinlosa, *Linn.*
6. Bryonia pilosa, *Roxb.*
7. Bryonia rostrata, *Rottle.*
8. Bryonia seabra,
9. Bryonia scabrilla, See:—Mukia scabrilla *Arn.* Melothria maderaspatana, *Linn.*
10. *Cephalandra indica, Naud. See:—Coccinia indica.
11. Citrullus colocynthis, *Schwd.*
12. *Citrullus vulgaris, *Schwd.* Var. Citrullus fistulosus. See:—Cucurbita citrullus.
13. *Coccinia indica, *W. & A.* See:—Momordica monadelpha, *Roxb.* Cephalandria indica.
14. Corallocarpus epigaea or epieous, *Rottl. & Willd.* See:—Bryonia epigaea.
15. Cucumis acutangulus, See:—Luffa acutangula.
16. Cucumis agrestis, *Naud.*
17. Cucumis anguinus.
18. Cucumis colocynthis.
19. *Cucumis melo, *Linn.* Var. Momordica Duthie. Utilissimus duthie.
20. Cucumis momordica, *Roxb. or Linn.*

52. Momordica cymbalaria, *Fenzl.* See:—Luffa tuberosa; Momordica tuberosa.
53. Momordica dioica, *Roxb.*
54. Momordica mixta.
55. Momordica monodelpha, monadelpha? *Roxb.* See:—Coccinia indica; Cephalandra indica.
56. Momordica muricata, See:—Momordica charantia, *Linn.*
57. Momordica umbellata, *Roxb.* See: — Zehneria umbellata.
58. Mukia scabrella, *Arn.* See:—Melothria maderaspatana, *Linn.* or Bryonia scabrilla.
59. Muricia cochin-chinensis.
60. Rhynchocarpa foetida, *C. B. Clarke & Schrad?* See:—Kedrostis rostrata.
61. *Trichosanthes anguina, *Linn.*
62. Trichosanthes cordata, *Roxb.*
63. Trichosanthes cucumerina, *Linn.*
64. Trichosanthes cuspida.
65. Trichosanthes dioica, *Roxb.* See:—Trichosanthes nervifolia.
66. Trichosanthes incisa.
67. Trichosanthes laciniosa.
68. Trichosanthes nervifolia, *Linn.* Use same as T. dioica, *Roxb.*
69. Trichosanthes, palmata, *Roxb.*
70. Zanonia indica, *Linn.*
71. Zehneria hookeriana, *Arn.* See:—Melothria perpusilla.
72. Zehneria umbellata, *Thw.* See:—Momordica umbellata, *Roxb.* Melothria heterophylla, *Cogn.*

## 53. CUPULIFERAE

1. Betula alba, *Linn.*
2. Betula alnoides, *Ham.*
3. Betula bhojapatra, *Wall. & Don.* Same as B. utilis, *Don. D.*
4. Betula utilis, *D. Don.*
5. Corylus avellana, *Linn.*
6. Corylus colurna, *Linn.*
7. Quercus incana, *Roxb.*
8. Quercus infectoria, *Oliv.* See:—Quercus tinctoria, *Oliv.*
9. Quercus lamellosa, *Smith.*
10. Quercus pachyphylla, *Kurz.*
11. Quercus tinctoria, *Oliv.* See:—Quercus infectoria, *Oliv.*

## 54. CYCADACEAE.

1. *Cycas circinalis, *Roxb & Linn.* Cycas inermes; C. rumphii.
2. Cycas inermes, See:—Cycas circinalis.
3. *Cycas revoluta, *Thumb. & Willd.*
4. *Cycas rumphii, Miq. See:—Cycas circinalis.

## 55. CYPERACEAE.

1. Cyperus bulbosus.
2. Cyperus canesceus.
3. Cyperus distachyos.
4. Cyperus inundatus, *Roxb.*
5. Cyperus iria, *Linn.*
6. Cyperus juncifolius, *Klein.*

7. Cyperus pertenuis, See:—Cyperus scariosus; Cyperus hexastachyus.
8. *Cyperus rotundus, *Linn.*
9. Cyperus scariosus, *Br.*
10. Cyperus tegetum, See:—Cyperus esculentus.
11. Fimbristylis junciformis, *Kunth.*
12. *Fimbristylis miliacea, *L. & Vahl.*
13. Kyllinga monocephala, *Rottb. & Roxb.* See:—Kyllinga triceps, Rotto.
14. Kyllinga triceps, *Rottb.* Used same as Kyllinga monocephala, *Roxb.*
15. Scirpus arti culatus, *Linn.*
16. Scirpus grossus, *Linn.* Use same as Scirpus kysoor, *Roxb.*
17. *Scirpus kysoor, *Roxb.* See:—Scirpus grossus, *Linn.*
18. Scirpus tuberosus.

## 56. DATISCACEAE.

1. Datisca cannabina, *Linn.*

## 57. DILLENIACEAE.

1. Dillenia indica, *Linn.* See:—Dillenia speciosa, *Thunb.*
2. Dillenia pentagyna.
3. Dillenia speciosa, *Thumb.* See:—Dillenia indica.

## 58. DIOSCORIACEAE.

1. Dinerba arabica, *Jacq.*
2. Dioscorea aculeata, *Linn.*
3. Dioscorea alata, *Linn.* See:—Dioscorea globosa; Dioscorea rubella.
4. Dioscorea bulbifera, *Linn.*
5. Dioscorea globosa, *Roxb.* See:—Dioscorea alata; Dioscorea hirsuta; *Dennst.* Dioscorea oppositifolia; *Linn.*
6. Dioscorea hirsuta, *Dennst.*
7. Dioscorea oppositifolia, *Linn.*
8. Dioscorea pentaphylla, *Linn.* See:—Dioscorea purpurea, *Roxb.* Dioscorea sativa, *Linn.*
9. Dioscorea purpurea, *Roxb.*
10. Dioscorea rubella, *Linn.* See:—Dioscorea alata.
11. Dioscorea sativa, *Linn.* See:—Dioscorea bulbifera.
12. Dioscorea triphylla, *Amoen & Linn.*

## 59. DIPSACEAE.

1. Morina persica, *Linn.*

## 60. DIPTERACEAE or DIPTEROCARPACEAE or DIPTEROCARPEAE

1. Dipterocarpus alatus, *Roxb.* See:—Dipterocarpus incanus; Dipterocarpus gonopterus.
2. Dipterocarpus camphora, See:—Camphora officinarum; Dryobalanops camphor or camphora.
3. Dipterocarpus incanus, *Roxb.* See:—Dipterocarpus alatus, Dipterocarpus turbinatus; Dipterocarpus laevis.
4. Dipterocarpus indicus, *Bedd.*
5. Dipterocarpus laevis, *Ham.* See:—Dipterocar-

pus turbinatus; Dipterocarpus alatus; Dipterocarpus incanus.
6. Dipterocarpus tuberculatus, *Roxb*. See:—Dipterocarpus grandifolius; Dipterocarpus cordatus.
7. *Dipterocarpus turbinatus, *Gaertn*. See:—Dipterocarpus incanus; *Roxb*. Dipterocarpus laevis; *Ham*. Dipterocarpus alatus, *Roxb*. Dipterocarpus jourdainii.
8. Dryobalanops aromatica, *Gaertn*. Dryobalanops camphora. (or dipterocarpaceae?)
9. Dryobalanops camphor or camphora, *Coleb*. See:—Dryobalanops aromatica or Camphora officinarum; Dipterocarpus camphora.
10. Hopea odorata, *Roxb*. See:—Hopea decandra.
11. Hopea racemosa. See:—Styrax benzoin.
12. Shorea lard.
13. Shorea robusta, *Gaertn*.
14. Shorea tumbuggaia, *Roxb*. *W. & A*. See:—Vatica tumbuggaia.
15. Vateria indica, *Linn*. See:—Vateria malabarica, & Chloroxylon dupada.
16. Vateria malabarica. See:-Vateria indica, *Linn*. Chloroxylon dupada.

## 61. DROSERACEAE.

1. Drosera lunata. See:—Drosera peltata.
2. Drosera peltata, *Sm*. See:—Drosera lunata; Drosera rotundifolia.
3. Drosera rotundifolia.

## 62. EBENACEAE.

1. Diospyros candolleana, *Wight*. See:—Diospyros canarica; D. ebenum, *Koenig*.
2. Diospyros cordifolia. See:—Diospyros embryopteris, *Pers*.
3. Diospyros ebenum, *Koening*. See: — Diospyros asimilis.
4. Diospyros embryopteris, *Pers*. See:—Diospyros peregrina; Diospyros glutinosa; Diospyros cordifolia; Diospyros urginiana.
5. Diospyros glutinosa. See:-Diospyros embryopteris, *Pers*.
6. Diospyros malabarica.
7. Diospyros melanoxylon, *Roxb*. See:—Diospyros tomentosa.
8. Diospyros montana, *Roxb*.
9. Diospyros paniculata, *Dalz*.
10. Diospyros tomentosa, *Roxb*. See:—Diospyros melanoxylon.
11. Diospyros urginiana. See:—Diospyros embryopteris, *Pers*.

## 63. ELAEAGNACEAE.

1. Elaeagnus hortensis, *M. biel*. See:—Elaeagnus angustifolia.
2. *Elaeagnus latifolia, *Linn*.
3. Elaeagnus umbellata, *Thunb*.
4. Hippophae rhamnoides, *Linn*.

See:—Chrozophora prostrata.

14a. Chrozophora rottleri. See:—Chrozophora tinctoria.

15. Chrozophora tinctoria, *A. Juss & Hook.* See:—Chrozophora rottleri.

16. Cleistanthus collinus, *Benth.* See:—Claytia collina.

17. Croton aromaticus, *Linn.*

18. Croton caudatus, *Geisel.*

19. Croton joufra, *Roxb.* See:—Croton malabaricus, *Bedd.*

20. Croton malabaricus, *Bedd.*

21. *Croton oblongifolius, *Roxb.*

22. Croton polyandrum or Polyandrus? *Roxb.* Same as C. tiglium. See:—Jatropha montana.

23. *Croton reticulatus, *Heyne.*

24. Croton tiglium, *Linn.*

25. *Emblica officinalis, *Gaertn.* See:—Phyllanthus emblica.

26. *Euphorbia antiquorum, *Linn.*

27. Euphorbia dracunculoides, *Lam.*

28. Euphorbia helioscopia, *Linn.*

29. *Euphorbia hirta, *Linn.* See:—Euphorbia pilulifera.

30. Euphorbia hypericifolia, *Linn.*

31. Euphorbia lathyris, *Linn.*

32. Euphorbia lingularia, *Roxb.* See:—Euphorbia neriifolia.

33. *Euphorbia neriifolia, *Linn.* See:—Euphorbia ligularia; Euphorbia nivulia.

34. Euphorbia nivulia, *Ham.* similar to Euphorbia neriifolia.

35. Euphorbia parviflora. See:—Euphorbia pilulifera.

36. *Euphorbia pilulifera, *Linn.* See:—Euphorbia hirta; Euphorbia parviflora; Euphorbia resinifera, Berg.

37. Euphorbia resinifera, *Berg.*

38. Euphorbia royleana, *Boiss.* See:—Euphorbia pentagona.

39. Euphorbia thomsoniana, *Boiss.*

40. Euphorbia thymifolia, *Linn & Burm.*

41. *Euphorbia tirucalli, *Linn.*

42. Excoecaria acerifolia, *F. didrichs.*

43. *Excoecaria agallocha, *Linn.* or Excoecaria camettia, or Arbor execans.

46. Excoecaria camettia, See:—Excoecaria agallocha.

47. *Flueggea leucopyrus, *Willd & Wight.* See:—Securinega leucopyrus.

48. *Flueggea microcarpa, *Blume.* See:—Flueggea virosa.

49. *Glochidion zeylanicum, *A. Juss.*

50. Homonoia riparia, *Lour.* See:—Adelia neriifolia.

51. Hura crepitans, *Linn.*

52. *Jatropha curcas, *Linn.*

87. Tragia cannabina. See:—Tragia involucrata, *Linn.*
88. *Tragia involucrata, *Linn.* See:—Tragia cannabina.
89. Trewia macrophylla. See:—T. nudiflora; Rottlera indica; Rottlera hooperiana.
90. *Trewia nudiflora, *Linn.* See:—Trewia macrophylla. Rottlera indica. Rottlera hooperiana.

## 68. FAGACEAE.

1. Castanea sativa, *Mill.* See:—Castanea vulgaris, *Lam.*

## 69. FICOIDACEAE, or FICOIDAE (AIZOACEAE).

1. *Giesekia pharnacoides, *Linn.*
2. Glinus lotoides.
3. Mollugo cerviana, *Seringe,* See:—Mollugo stricta; *Linn.* Mollugo triphylla.
4. Mollugo hirta, *Thumb.* See:—Pharnaceum pentagonum, *Roxb.*
5. Mollugo pentaphylla, *Linn.* See:—Mollugo stricta.
6. Mollugo spergula, *Linn.* See:—Mollugo oppositifolia, *Linn.*
7. Mollugo stricta, *Linn.* See:—Mollugo pentaphylla.
8. Trianthema decandra, *Linn.*
9. *Trianthema monogyna, *Linn.* See:—Trianthema Obcordata; Trianthema pentandra, *Linn.* Trianthema portulacastrum, *Linn.*
10. Trianthema obcordata, See:—Trianthema pentandra, *Linn.* Trianthema monogyna, *Linn.*
11. *Trianthema pentandra, *Linn.* See:—Trianthema obcordata.
12. Trianthema portulacastrum, *Linn.* See:—Trianthema monogyna, *Linn*

## 70. FLACOURTIACEAE.

1. Flacourtia cataphracta, *Roxb.*
2. Flacourtia obcordata. See:—Flacourtia sepiaria.
3. Flacourtia ramontchi, *L. Herit.* See:—Flacourtia sapida.
4. Flacourtia sapida, *Roxb.*
5. Flacourtia sepiaria, *Roxb.* See:—Flacourtia obcordata.
6. Gynocardia odorata, *R. Br.* or Gynocardia hydnocarpus and Taraktogenos kurzii, Chaulmoogra odorata, Chilmoria dodecandra.
7. Hydnocarpus alpina, *Wight.*
8. Hydnocarpus anthelmintica, *Pierre.*
9. Hydnocarpus castanea, *Hk. f. & T.*
10. Hynocarpus heterophyllus, *Kurz.* See:—Taraktogenos Kurzii.
11. Hydnocarpus inebrians, *Wall* or *Vahl.* See:—Hydnocarpus wightiana, *Blume.*

## 71. FLORIDEAE.



## 72. FRANKENIACEAE.



## 73. FUMERIACEAE.



## 74. FUNGI.



## 75. GENTIANACEAE.

16. Limnanthemum nymphaeoides, *Link*. See:—Menyanthes nymphaeoides, *Linn*.
17. Menyanthes trifoliata, *Linn*.
18. Ophelia angustifolia, *Don*. See:—Swertia angustifolia; Swertia chiretta; Gentiana kurroa.
19. Ophelia chiretta, or chirata *DC*. See:—Swertia chiretta or chirata. Gentiana kurroa or kurroo.
20. Ophelia eligans or elegans or eligam? *Wight*. See:—Ophelia chiretta; Ophelia angustifolia; Ophelia multiflora; See:—Swertia angustifolia.
21. Ophelia multiflora, *Dalz*. See:—Swertia decussata; Swertia chiretta; & Gentiana kurroa.
22. Pladera decussata, See:—Canscora decussata, *Schutt*.
23. Swertia affinis, *C. B. Clarke*. See:—Swertia angustifolia, *Ham*.
24. Swertia alata, *Royle*. See:—Ophelia alata. *Griseb*.
25. Swertia angustifolia, *Ham*. See:—Swertia affinis; Swertia pulchella. Var:—Pulchella, *Burkill*; See:—S. affinis, Opelia elegans.
26. Swertia chirata, *Ham*. See:—Ophelia chirata, *DC*. Swertia affinis; Swertia paniculata; Swertia purpurascens; Swertia angustifolia.
27. Swertia corymbosa, *Wight*.
28. Swertia decussata, *Nimmo*. See:—Ophelia alba.
29. Swertia paniculata, *Wall*.
30. Swertia parensis, *Linn*. or Swertia perennis, *Linn*.
31. Swertia purpurascens, *Wall*.

## 76. GERANIACEAE.

1. Geranium nenalense, *Sweet*. See:—Geranium affine; G. ocellalum; G. rubertianum.
2. Geranium ocellatum, *Camb*. Var:—Geranium himalaicum, *R. Kunth*.
3. Geranium robertianum, *Linn*.
4. Geranium wallichianum, *Sweet*.

## 77. GNETACEAE.

1. Ephedra alata, See:—Ephedra peduncularis.
2. Ephedra alte. See:—Ephedra peduncularis.
3. Ephedra distachya, *Linn*. See:—Ephedra vulgaris.
4. Ephedra gerardiana, *Wall*. See:—Ephedra vulgaris. Var:—saxatilis, sikkimensis & wallichii.
5. Ephedra intermedia, *Schrenk & May*. See:—Ephedra vulgaris; Ephedra pachyclada, *Boiss*. Var:—Glauca & Tibetica.
6. Ephedra monostachya. See:—Ephedra vulgaris, E. intermedia.
7. Ephedra pachyclada, *Boiss*. See:—Ephedra in-

## 78. GOODEMACEAE or GOODENIACEAE.



## 79. GRAMINACEAE



## 80. GRAMINEAE, or GRAMINACEAE.

23. Cenchrus bifloris, *Roxb.*
24. Chloris barbata, *Sw.*
25. Coix lachryma, *Jobi, Linn.*
26. Cymbopogon caesius, *Staph.*
27. *Cymbopogon citratus, *Stap.* & Cymbopogon flexuosus, or Cymbopogon shoenanthus. See:—Andropogon citratus.
28. Cymbopogon flexuosus, *Stapf.* See:—Cymbopogon citratus; Andropogon citratus; Cymbopogon shoenanthus.
29. Cymbopogon schoenanthus, *Spreng.* See:—Andropogon shoenanthus; A. laniger.
30. *Cynodon dactylon, *Pers.*
31. Cynodon linearis.
32. *Dendrocalamus strictus, *Nees.*
33. *Eleusine aegyptiaca, *Desf.* See:— Dactyloctenium aegyptium.
*See:—Sorghum halepense.
34. *Eleusine coracana, *Gaertn.* Eleusine aegyptiaca, & Eleusine indica.
35. Eleusine indica. *Gaertn.* See:—Eleusine coracana.
36. Eragrostis abyssinica.
37. Eragrostis cynesuroides, *Beauv.* See:—Desmostachya bipinnata. Poa—cynosuroides, *Retz.*
37a. Grandiflorus plenissimus.
38. Hordeum vulgare, syno:—Hordeum sativum, *Linn.* Hordeum decorticatum; Hordeum distichon; Hordeum hexastichon.
39. Iseilema anthephoroides, *Hack.*
40. Iseilema wightii, *Anders.*
41. Lamarkia aurea, *Moench.*
42. Lolium temulentum, *Linn.*
43. Manisuris granularis, *Sw. & Linn.*
44. Melica ciliata, *Duthie.*
45. Molinia coerulea, *Moench.*
46. *Oryza sativa, *Linn.*
47. Panicum antidotale, *Retz.*
48. Panicum cruscorui, *Linn.* See:—Echinochloa crus-galli, *P. Beauv.*
49. Panicum crusgalli, *Linn.* See:—Panicum frumentaceum; Panicum italicum; See:—Echinochloa crusgalli, *P. Beauv.*
50. Panicum dactylum, or Panicum dactylon, *Linn.* See:—Cynodon dactylon, *Persoon.*
51. Panicum frumentaceum, *Roxb.* See:—Panicum crusgalli, *Linn.* Panicum italicum; Echinochloa colona; Echinochloa frumentacea; Echinochloa crusgalli.
52. Panicum isachne, *Roth.*
53. *Panicum italicum, *Linn.* See:—Panicum frumentaceum, *Roxb.* See:—Setaria italica, *Beauv.*
54. *Panicum javanicum, *Poir.*
55. Panicum jumentorum. See:—Panicum maximum, *Jacq.*
56. Panicum maximum, *Jacq.* See:—Panicum jumentorum.
57. Panicum miliaceum, *Linn.*

## 81. GUTTIFERAE.

1. Calophyllum decifient. See:—Calophyllum wightianum.
2. *Calophyllum inophyllum. *Linn.* See:—Balsamaria inophyllum.
3. Calophyllum wightianum, *Wall.* or Calophyllum decifient. See:—Calophyllum apetalum.

3(a):—Calysaccion longifolium, *Wight.*—See: Mesua ferrea.

4. Garcinia cambodia, *Desr.*
5. Garcinia handburii, *B.P.* See:—Garcina pictoria.
6. Garcinja heterandra, *Wall.*
7. *Garcinia indica, *Chois.* See:—Garcinia purpura; Brindonia indica.
8. *Garcinia mangostana, *Linn.*
9. Garcinia morella, Desr. See:—Garcinia gutta; Garcinia pictoria.
10. Garcinia pedunculata, *Roxb.*
11. Garcinia pictoria, *Roxb.* Garcinia morella; Garcinia hanburii, *B.P.*
12. *Garcinia purpurea, *Roxb.* See:—Garcina indica.
13. Garcinia wightii.
14. *Garcinia xanthochymus, *Hook.* See:— Garcinia tinctoria; xanthochymus tinctorius.
15. Longifolium ochrocarpus, *Hk. f. & T.* See:—Ochrocarpos longifolius, *Benth. & Hook.*
16. Mesua coromandeliana, *Wight.* See:—Mesua ferrea, etc.
17. Mesua ferrea, *Linn.* See:— Mesua roxburghii; Mesua coromandeliana; Mesua speciosa; Mesua pedunculata.
18. Mesua pedunculata, *Wight.* See:—Mesua ferrea; Mesua coromandeliana; Mesua roxburghii; Mesua speciosa.
19. Mesua roxburghii. See:—Mesua ferrea. Mesua coromandeliana; Mesua speciosa; Mesua pedunculata.
20. Mesua speciosa, *Chois.* See:—Mesua ferrea.
21. *Ochrocarpos longifolia or longifolius. *Benth & Hook.* See:—Longifolium ochrocarpus, *Hk. f. & T.* Mesua ferrea. *Schult.* See:—Sanseviera
22. Xanthochymus pictorius, *Roxb.* See:—Garcinia Xanthochymus, *Hk.* Garcinia tinctoria, *Dunn.* Garcinia pictoria, *Roxb.*

## 82. HAEMODORACEAE.

1. Sansevieria roxburghiana,
2. Sansevieria zeylanica, *Willd.* See:—Sansevieria roxburghiana. *Schult.*

## 83. HAMAMELIDACEAE.

1. Altingia excelsa, *Noronha.*
2. Liquidambar orientalis, *Miller.*

## 84. HELICTEREAE.

1. Peterospermum aserifolium.
2. Peterospermum heyneanum.

9. Colebrookea oppositifolia. *Sm.* See:—Colebrookea ternifolia.
10. Coleus amboinicus, *Lour.* See:—Coleus aromaticus.
11. **Coleus aromaticus, Benth.* See:—Coleus amboinicus; C. carnosus; Phectranthus aromaticus.
12. Coleus barbatus, *Benth.*
13. Coleus carnosus, See:—Selaginella imbricata.
14. Coleus malabaricus.
15. Coleus scutellarioides.
16. Coleus spicatus, See:—Anisochilus carnosus.
17. Dracocephalum moldavicum, *Linn.*
18. Dracocephalum royleanum, *Royle.*
19. Eremostachys vicaryi, *Benth.*
20. Geniosporum prostratum, *Benth.*
21. Hyssopus officinalis, *Linn.*
22. Hyssopus parviflora, *Benth.*
23. Lallemantia royleana, *Benth.*
24. Lavandula bipinnata, *O. Ktze.* See:—Lavandula burmanni, *Benth.*
25. Lavandula burmanni, *Benth.* See:—Lavandula bipinnata.
26. Lavandula carnosa, See:—Aniscochilus carnosus, *Wall.*
27. Lavandula stoechas, *Linn.* See:—Romero santa.
28. *Leonitis nepetaefolia, *R. Br.* See:—Phlomis nepetaefolia, *Roxb.*
29. Leonurus sibiricus, *Linn.*
30. *Leucas aspera, *Spreng.* See:—Phlomis esculenta.
31. **Leucas cephaletes Spreng.* See:—Leucas aspera, & Leucas linifolia.
32. *Leucas linifolia, *Spreng.* See:—Leucas cephalotes; Leucas aspera.
33. Leucas stelligera, *Wall.*
34. Leucas zeylanica, *R. Br.*
35. Lycopus europaeus, *Linn.*
36. Majorana hortensis, *Moench.* See:—Origanum majorana, *Linn.* Origanum vulgare, *Linn.*
37. Marrubium germanicum, See:—Marrubium hamalalium; Marrubium vulgare.
38. Marrubium hamalalium, See:—Marrubium vulgare; Marrubium germanicum.
39. Marrubium vulgare, *Linn.* or Marrubium hamalium; Marrubium germanicum.
40. Melissa parviflora, *Benth.*
41. Mentha acquatica, *Linn.* See:—Mentha piperita, *Linn.* Mentha officinalis; Mentha vulgaris; Mentha incana; Mentha hirsuta; Mentha Canadensis or canadense?
42. Mentha arvensis, *Linn.* See:—Mentha canadensis; Mentha piperascens.
43. Mentha canadensis, *(Japanese)* See:— Mentha arvensis, *Linn.*
44. Mentha piperascens, (Japanese). See:—Mentha arvensis, *Linn.* Mentha canadensis, *(Japanese).*
45. *Mentha piperita, *Linn.* See:—Mentha incana; Mentha hirsuta; Mentha canadensis or canadense; Mentha aquatica; M.

73. *Origanum majorana, *Linn.* See:—Origanum vulgare; Majorana hortensis, *Moench.*
74. Origanum vulgare, *Linn.*
75. Orthosiphon stamineus, *Benth.* See:—Ocimum, grandiflorum; Ocimum longifolium or longiflorum?
76. Otostegia limbata, *Benth. & Hook.*
77. Perovskia abrotanoides, *Karel.*
78. Perovskia atriplicifolia, *Benth.*
79. Phlomis cephalotes, See: —Leucas cephalotes.
80. Phlomis nepetafolia, *Roxb.* See:—Leonitis nepetaefolia.
81. Phlomis zeylanica, See:— Leucas.
81a. Plectranthus aromaticus, See: Colens aromaticus.
82. Plectranthus strobiliteros, See:—Anisochilus carnosus, *Wall.*
83. Pogostemon parviflorus, *Benth.* See:—Pogostemon purpurascens, Pogostemon plectranthoides; Pogostemon purpuricalis.
84. *Pogostemon patchouli, *Pellet.*
85. Pogostemon plectranthoides, *Desf.* Pogostemon purpurascens; Pogostemon purpuricalis. Same as Pogostemon parviflorus, *Benth.*
86. Pogostemon purpurascens, *Dalz.* Same as Pogostemon parviflorus. See:— Pogostemon purpuricalis; Pogostemon plectranthoides.
87. Pogostemon purpuricalis. See:—Pogostemon parviflorus; Pogostemon purpurascens, *Dalz.* Pogostemon plectranthoides, *Desf.*
88. Prunella vulgaris, *Linn.*
88a. Romero santa, See:— Lavandula stoeches, *Linn.*
89. Rosmarinus officinalis, *Linn.*
90. Roylea eleganus, *Wall.*
91. Salvia aegyptiaca, Linn. Var:—Salvia pumilla.
92. Salvia haematodes or haemotodes? *Wall.*
93. Salvia moorcroftiana, *Wall.*
94. *Salvia officinalis, *Linn.*
94a. Salvia plebeia, R. Br. See:—Salvia brachiata; Salvia pumila.
95. Salvia pumila, *Benth.* or pumilla? Use same as Salvia plebeia.
96. Salvia spinosa, *Linn.*
97. Scutellaria galericulata, *Linn.*
98. Scutellaria indica, *Linn.*
99. Stachys parviflora, *Benth.*
100. Teucrium chamaedrys, *Linn.*
101. Teucrium polium, *Linn.*
102. Teucrium scordium, *Linn.*
103. Thymus gracilis. See:— Thymus vulgaris, *Linn.* Thymus zygis, *Linn.*
104. Thymus serpyllum, *Linn.* Thymus vulgaris, *Linn.*
105. Thymus vulgaris, *Linn.* See:—Thymus serpyllum, *Linn.*
106. Thymus zygis, *Linn.* See:—Thymus vulgaris, *Linn.* Thymus gracilis.
107. Zataria multiflora, *Boiss.*
108. Ziziphora tenuior, *Linn.*

## 96. LAURACEAE.



## 96a. LAURINEAE.

*Forsk.*
2. Sassafras officinale, *Nees.*

## 97. LEGUMINOSAE or LEGUMINOSEAE.

1. *Acacia scadens, or scandens? See:—Entada scandens.
2. *Aeschynomene grandiflora, *Linn.* See:—Agati grandiflora.
3. *Agati grandiflora, or grandifolia? *Desv.* See:—Aeschynomena grandiflora; Sesbania grandiflora.
4. Andira araroba.
5. Atylosia barbata, *Baker.*
6. Coronelia grandiflora, See:—Agati grandiflora.
7. Cytisus cajan. See:—Cajanus indicus.
8. Hedysarum alhagi, *Linn.* See:—Alhagi maurorum.
9. Hedysarum gangeticum, *Linn.* See:—Desmodium gangeticum.
10. Hedysarum purpureum, *Roxb.* See:—Desmodium polycarpum.
11. Hedysarum triflorum, *Linn.* See:—Desmodium triflorum, or Desmodium heterophyllum.
12. Hedysarum tuberosa, *Linn.* & *Roxb.* See:—Pueraria tuberosa.
13. Jonesia asoka, *Roxb.* See:—Jonesia pinnata. Saraca indica, *Linn.*
14. Jonesia pinnata, *Roxb.* & See:—Jonesia asoka. Saraca indica, *Linn.*
15. Lotus corniculatus, *Linn.*
16. Lupinus albus, *Linn.*
17. Medicago sativa.
18. Mezoneurum sumatranum, *W.A.*
19. Pachyrhizus angulatus, *Rich.* See:—Dolichos bulbosus.

## 98. LENTIBULARIACEAE.

1. Urticularia bifida, *Linn.*

## 99. LICHENES.

1. Lichin odoriferous, See:—Parmelia perlata.
2. Parmelia kamstschadalis, *Ach.* See:—Parmelia perlata. Parmelia perforata. Parmelia parietina. Lichin odoriferous.
3. Parmelia parietina. See:—Parmelia perlata. Parmelia perforata. Parmelia karatschadalis. Lichin odoriferous.
4. Parmelia perforata. See:—Parmelia perlata. Parmelia parietina. Parmelia kamstchadalis, *Ach.* Lichin odoriferous.
5. Parmelia perlata, *Ach.* See:—Parmelia karatschadalis. Parmelia parietina. Parmelia perforata. Lichin odoriferous.

## 100. LILIACEAE.

1. Allium ampeloprasum, *Linn.* See:—Allium porrum.
2. *Allium ascalonicum, *Linn.*
3. *Allium cepa, *Linn.* or Allium porrum, or Allium ascalonicum.
4. Allium leptophyllum, *Wall.*

50. Urginea scilla, *Steinh.* See:—Urginea indica; Urginea maritima.
51. Yucca gloriosa, *Linn.*

## 101. LINACEAE.

1. Hugenia mystax, *Linn.*
2. Linum usitatissimum, *Linn.*
3. Modera canni, See:—Hugonia mystax, *Linn.*
4. Reinwardtia trigyna, *Planch.* See:—Reinwardtia tetragyna, *Planch.*

## 102. LOGANIACEAE.

1. *Fagraea fragrans, *Roxb.* See:—Cyrtophyllum peregrinum.
2. Fagraea imperialis *Miq.*
3. Fagraea racemosa, *Jack.*
4. Strychnos axillaris, *Coleb.*
5. Strychnos blanda.
6. Strychnos bourdilloni, *Sp. Nova Brandis.*
7. Strychnos cinnamomifolia, *Thu.* See:—S. bourdilloni; S. colubrina.
8. Strychnos colubrina, *Wall. & Linn.* See:—S. nux vomica; Lignum colubrinum; & S. cinnamomifolia.
9. Strychnos gaultheriana, *Pier.*
10. Strychnos ignatii, *Berg.*
11. Strychnos maingayi, *Clarke.*
12. Strychnos minor.
13. *Strychnos nux vomica, *Linn.*
14. Strychnos potatorum, *Linn.*
15. Strychnos rheedei, *Clarke.*
16. Strychnos wallichiana, *Benth.*

## 103. LORANTHACEAE.

1. *Loranthus elasticus, *Desr.*
2. Loranthus falcatus, *Linn.* See:—Loranthus longiflorus.
3. Loranthus longiflorus, *Desr.* See:— Loranthus falcatus.
4. Viscum album, *Linn.*
5. Viscum a r t i culatum, *Burm.*
6. *Viscum monoicum, *Roxb.*
7. Viscum orientale, *Willd.*

## 104. LYCOPODIACEAE.

1. *Lycopodium clavatum, *Linn.* See:—Lycopodium spores.
2. Lycopodium spores, See: —Lycopodium cavatum.

## 105. LYTHRACEAE.

1. Ammannia baccifera, *Linn.* See:—Ammannia vesicatoria.
2. Ammannia octandra.
3. Ammannia senegalensis, *Lam. & DC.* See:—Ammannia auriculata.
4. Grislea tomentosa, *Roxb.* See:—Woodfordia floribunda.
5. *Lagerstroemia flos-reginae, *Retz.*
6. *Lagerstroemia lanceolata, *Wall.*
7. *Lagerstroemia parir-flosh, or parviflora, *Roxb.*
8. Lawsonia alba, *Lam.* & Lawsonia spinosa; & Lawsonia inermis.
9. Lawsonia inermis, *Linn.* See:—Lawsonia alba; Lawsonia spinosa.

## 106. MAGNOLIACEAE.



## 107. MALPIGHIACEAE.



## 108. MALVACEAE.

15. *Gossypium indicum. See:- Gossypium herbaceum.
16. *Gossypium neglectum, *Tod.* See:—Gossypium vera or Vera rosea?
17. Gossypium obtusifolium, *Roxb.*
18. Gossypium religiosum, *Watt.*
19. Hibiscus abelmoschus, *Linn.* or Hibiscus moschatus, or Bamia moschatus or Abelmoschus moschatus.
20. *Hibiscus cannabinus, *Linn.* See:—Corchorus capsularis, *Linn.* Hibiscus cannabiscus.
21. Hibiscus cannabiscus, See:—Hibiscus Cannabinus, *Linn.* Corchorus capsularis, *Linn.*
22. *Hibiscus esculentus, *Linn.* Var:—cancellatus or H. longifolia. See:—Abelmoschus esculentus.
23. Hibiscus furcatus, *Willd.* See:—Hibiscus aculeatus, *Roxb.*
24. Hibiscus lampas, *Cav.* See:—Thespesia lampas, Thespesia macrophylla, *Detz.*
25. Hibiscus micranthus, *Linn.*
26. Hibiscus moschatus. See:- Bamia moschatus & Abelmoschus moschatus, Hibiscus abelmoschus.
27. Hibiscus populneus, or *Linn.* Hibiscus populnea? See:—Thespesia populnea.
28. *Hibiscus Rosa-sinensis, *Linn.*
29. Hibiscus sabdariffa, *Linn.*
30. *Hibiscus tiliaceus, *Linn.* See:—Hibiscus tortuosus; Paritium tiliaceum; Kydia calycina, *Roxb.*
31. Hibiscus vulgaris.
32. Kydia calycina, *Roxb.* See:—Hibiscus tiliaceus. Kydia roxburghiana; Kydia fraterna.
33. Kydia fraterna, *Roxb.* See:—Kydia calycina.
34. Kydia roxburghiana, *Wight.* See:—Kydia calycina.
35. Malachra capitata, *Linn.* See:—Hibiscus tiliaceus.
36. Malva parviflora, *Linn.*
37. Malva roundifolia, *Linn.*
38. Malva sylvestris, *Linn.* See:—Malva vulgaris.
39. Malva vulgaris, *Fries.* See:—Malva sylvestris.
40. Pavonia odorata, *Willd.*
41. *Pavonia procumbens, *Boiss.*
42. Pavonia zeylanica, *Cav.* See:—Pavonia odorata.
43. Sida acuta, *Burm.* See:—Sida carpinifolia; Sida lanceolata.
44. Sida alba, See:—Sida spinosa; Sida alinifolia.
45. Sida alinifolia, See:—Sida alba; Sida spinosa, *Linn.*
46. Sida altheifolia. See:—Sida cordifolia; Sida herbacea; Sida rotundifolia.
47. *Sida carpinifolia, *Linn.* See:—Sida acuta; Sida lanceolata.
48. Sida cordifolia, *Linn.* See:—Sida althaeifolia; Sida herbacea; Sida rotundifolia; Sida rhombifolia; Sida rhomboidea;

## 109. MARSILIACEAE.



## 110. MELASTOMACEAE.



## 111. MELIACEAE.

7. Chukrasia tabularis, *Adr. Juss.*
8. Dysoxylum malabaricum *Bedd.*
9. Heynea sumatrana, *Miq.*
10. *Heynea trijuga, *Roxb.* See:—Walsura trijuga.
11. Melia azadirachta, *Linn.* See:—Azadirachta indica, *Juss.*
12. *Melia azedrach, *Linn.* See:—Melia sempervirens.
13. Melia dubia, *Hiern* or *Cav.* See:—Melia composita.
14. Melia robusta, *Roxb.* See:—Melia superba. Melia compositae.
15. Melia sempervirens, *Sw.* See:—Melia azedarach.
16. Melia superba, See:—Melia dubia; Melia robusta.
17. Naregamia alata, *W. & A.*
18. Sandoricum indicum, *Cav.* See:—Melia koetjape.
19. *Soymida febrifuga, *Adr. & Juss.* See:—Swietenia febrifuga; Soymida or Swietenia rubra.
20. Swietenia febrifuga, *Roxb.* See:—Swietenia rubra; Soymida febrifuga.
21. Swietenia rubra, See:—Swietenia febrifuga, *Roxb.* Soymida febrifuga, *Adr. Juss.*
22. Turraea villosa, *Benn.*
23. Walsura piscidia, *Roxb.*

## 112. MENISPERMACEAE.

1. Anamirta cocculus, *Wight & Arn.* See:—Minispermum cocculus; Minispermum heteroclitum; Minispermum monadelphum; Anamirta paniculata; Anamirta toxifera; Cocculus flavescens.
2. Anamirta paniculata, *Coleb.* See:—Anamirta cocculus; Anamirta toxifera. Cocculus suberosus.
3. Cissampelos hernandifolia, See:—Cissampelos hexandra.
4. Cissampelos hexandra, *Roxb.* or Cissampelos hernandifolia, See:—Stephania hernandifolia.
5. *Cissampelos pareira, *Linn.* See:—Cissampelos caapeba; Cissampelos convolvulacea; Cissampelos triandra; Batta valle.
6. *Cocculus cordifolia, or Cocculus cordifolius? See:—Tinospora cordifolia, *Miers.* Menispermum cordifolium; Tinospora malabarica.
7. Cocculus indicus. See:—Cocculus suberosus.
8. Cocculus leaeba, *DC.* See:—Similar to Tinospora cordifolia.
9. Cocculus suberosus or Cocculus indicus.
10. Cocculus villosus, *DC.* See:—Cocculus hirsutus.
11. Coscinium fenestratum, *Colebr.* See:—Menispermum fenestratum, *Gaertn.*
12. Fibraurea tinctoria, *Lour.*
13. Jaterohiza calumba, *Miers.*

## 113. MIMOSACEAE, or MIMOSEAE or MIMOSOIDEAE

23. Entada scandens, *Benth.* See:—Entada pusaetha, or Acacia scandens or scadens?
24. Entada pusaetha, See:—Entada scandens, *Benth.*
25. Mimosa amara, *Roxb.* See:—Albizzia amara, *Boivin & Roxb.*
26. Mimosa arabica, See:—Acacia arabica.
27. Mimosa catechu, *Linn.* See:—Acacia catechu, *Willd.*
28. Mimosa cinerea, See:—Dichrostachys cinerea, *W. & A.*
29. Mimosa entade, See:—Entada scandens.
30. Mimosa farnesiana, See:—Acacia farnesiana.
31. Mimosa kalkora, or Albizzia julibrissin, *Durazz.*
32. Mimosa lucida, *Roxb.*
33. Mimosa mutabilis, See:—Mimosa rubicaulis.
34. Mimosa paniculata.
35. *Mimosa pudica. *Linn.*
36. Mimosa rubricaulis, *Lam.* See:—Mimosa mutabilis.
37. Mimosa saponaria, See:—Acacia concinna, *DC.*
38. Mimosa sirissa, See:—Acacia speciosa.
39. Mimosa suma, *Roxb.* See:—Acacia suma.
40. Neptunia oleracea, *Lour.* See:—Mimosa natans.
41. Pithecellobium bigeminum, *Mart & Benth.* See:—Mimosa lucida, *Roxb.*
42. *Pithecellobium dulce, *Benth.* See:—Inga dulcis.
43. Pithecellobium fasciculatum, *Benth.*
44. Pithecellobium lobatum, *Benth.*
45. *Pithecellobium saman.
46. Prosopis spicigera, *Linn.*
47. Xylia dolabriformis, *Benth.*

## 114. MORINGACEAE.

1. Moringa concanensis, *Nimmo.*
2. Moringa oleifera, *Lam.* See:—Moringa pterygosperma; Guilandina moringa; Hyperanthera moringa.
3. Moringa pterygosperma, *Gaertn.* Guilandia moringa; Hyperanthera moringa; Moringa oleifera.

## 115. MYRICACEAE.

1. Myrica cerifera, See:—Myrica nagi; Myrica sapida.
2. Myrica integrifolia, *Roxb.* See:—Myrica nagi.
3. Myrica nagi, Thunb. See:—Myrica sapida; Myrica integrifolia; Myrica cerifera.
4. Myrica sapida, *Thunb.* See:—Myrica nagi; Myrica sapida; Myrica cerifera.

## 116. MYRISTICACEAE.

1. Myristica aromatica, See:—Myristica fragrans, *Houtt.* Myristica officinalis, *Linn.* Myristica moschata, *Thunb.*
2. Myristica fragrans, *Hout.* See:—Myristica officinalis, *Linn.* Myristica mos-

## 117. MYRSINACEAE, or MYRSINEAE.



## 118. MYRTACEAE.

20. *Melaleuca leucadendron, *Linn.* or Melaleuca cajuputi; Melaleuca minor.
21. Melaleuca minor. See:-- Melaleuca cajuputi; Melaleuca leucadendron, *Linn.*
22. Myrtus caryophyllus, See:—Sizygium caryophyllum; Caryophyllus aromaticus; Eugenia caryophyllata.
23. *Myrtus communis, *Linn.*
24. *Psidium guyava, *Linn.* Var:—Psidium pyriferum; (White); Psidium pomiferum (red); See:—Syzygium jambolanum; Eugenia jambolana.
25. Psidium pomiferum, (Red); Psidium pyriferum (white); See:—Syzygium jambolanum; Eugenia jambolana; Jambosa vulgaris; Ficus carica.
26. Psidium pyriferum, (white), See:--Psidium guyava; Psidium pomiferum; Syzygium jambolanum; Eugenia jambolana; Jambosa vulgaris.
27. Syzygium caryophyllum, See:—Myrtus caryophyllum, or Myrtus caryophyllus? Caryophyllus aromaticus; Eugenia caryophyllata.
28. *Syzygium jambolanum. See:—Eugenia jambolana, *Lam.*

## 119. NAIADACEAE.

1. Triglochin maritima, *Linn.*.
2. Triglochin palustris, *Linn.*

## 120. NYCTAGINACEAE.

1. *Boerhaavia diffusa, See:—Boerhaavia erecta; Boerhaavia procumbens; Boerhaavia repens.
2. Boerhavia erecta.
3. Boerhavia procumbens. *Roxb.* Boerhavia diffusa.
4. Boerhavia repens.
5. *Mirabilis jalapa, *Linn.*
6. Pisonia aculeata, *Linn.*
7. Pisonia alba, *Spanog.* See:—Pisonia morindaefolia, *R. Br.*
8. Pisonia morindaefolia, *R. Br.* See:—Pisonia alba.

## 121. NYMPHAEACEAE.

1. Castalia alba, See:—Nymphaea alba; Nymphaea cachemeriana; Nymphaea odorata; Nymphaea versicolor.
2. Castalia lotus.
3. Euryale ferox, *Salish.* See:—Nymphae stellata; Annesled spinosa.
4. *Nelumbium speciosum, *L. & Willd.* See:—Nelumbo nucifera, *Gaertn.*
5. Nelumbo nucifera, *Gaertn.* See:—Nelumbium speciosum.
6. Nymphaea alba, *Linn.* See:—Nymphaea versicolor; Nymphaea odorata; Castalia alba. Nymphaea cachemeriana.
7. Nymphaea cachemeriana, *Cambess.* See:—Nymphaea alba; Nymphaea odorata; Nymphaea versicolor. Castalia alba.
8. Nymphaea cyanea.

## 122. OCHNACEAE.



## 123. OLEACEAE.

31. Syringa persica, *Linn.* See:—Syzygium caryophyllata.
32. Ximenia americana, *Linn or Willd.*

## 124. ONAGRACEAE.

1. Epilobrium fruticosum, See:—Jussieua suffruticosa.
2. Jussieua suffruticosa, *Linn.* See:—Jussieua villosa.
3. Jussieua villosa, See:—Jussieua suffruticosa. Epilobrium fruticosum.
4. Trapa bicornis, See:—Trapa bispinosa, *Roxb.* Tribulus aquaticus.
5. Trapa bispinosa, *Roxb.* See:—Trapa bicornis; & Trapa natans.
6. Trapa natans, *Linn.* See:—Trapa bispinosa, *Roxb.* Trapa bicornis; Tribulus aquaticus.
7. Tribulus aquaticus, See:—Trapa bispinosa, *Roxb.* Trapa natans, Linn. Trapa bicornis.

## 125. OPHIOGLOSSACEAE.

1. *Botrychium lunaria, *Sw.*
2. Helminthostachys zeylanica, *Hook. & Linn.*

## 126. ORCHIDEAE. Also known as ORCHIDACEAE.

1. Calanthe.
2. Cattleya.
3. Dendrobium crumenatum, *Sw.*
4. Dendrobium macraei, or macrael? *Lindl.* See:—Desmotrichum fimbriatum.
5. *Eulophia campestris, *Wall.* See:—Eulophia vera; Eulophia virens.
6. Eulophia nuda, *Lindl.*
7. Eulophia vera.
8. *Eulophia virens, *Brown.*
9. Liparis parviflora, *Lindl.*
10. Luisia brachystachys, *Blume.*
11. Orchis latifolia, *Linn.* See:—Orchis laxiflora, *Lam.*
12. Orchis laxiflora, *Lam.* See:—Orchis mascula, *Linn.* Orchis latifolia, Allium macleani.
13. Orchis mascula, *Linn.* Similar to Orchis laxiflora; Orchis latifolia; Allium macleani.
14. Phalaenopsis amabilis, *Lindl.*
15. *Saccolabium papillosum, *Lindl.* See:—Saccolabium praemorsum, *Hook.* Saccolabium wightianum, *Hook.*
16. Saccolabium praemorsum, *Hook.* See:—S. papillosum. *Hook.*
17. Saccolabium wightianum, *Hook.* See:—S. papillosum; Acampe wightiana; Saccolabium praemorsum, *Hook.*
18. Vanda caerulea.
19. *Vanda roxburghii, *R. Br.* See:—Vanda spathulata, *Spreng.* Vanda tessellata.
20. Vanda spathulata, *Spreng.* See:—V. roxburghii.
21. Vanilla planifolia, *Andr.*

8. Papaver argemone, *Linn.* See:— Argemone mexicana, *Linn.*
9. Papaver dubium, *Linn.* See:—P. rhoeas.
10. Papaver glabrum. See:— Papaver s o m n i ferum, *Linn.* Papaver setigerum.
11. Papaver hybridum, *Linn.*
12. Papaver nudicaule, *Linn.*
13. Papaver orientale, *Linn.*
14. Papaver rhoeas, *Linn.*
15. *Papaver s o m niferum, *Linn.* See:—Papaver glabrum; Papaver setigerum.

## 132. PAPILIONACEAE.

1. *Abrus precatorius, *Linn.* or Abrus minor, or Abrus pauciflorus, *Linn.*
2. Aeschynomene s e s ban, See:—Sesbania aegyptiaca.
3. Alhagi camelorum, *Fisch.* See:—Alhagi maurorum.
4. Alhagi maurorum, *Desv. or Baker.* See:—A. camelorum.
5. Alysicarpus longifolius, *W. & A.*
6. Alysicarpus m o n i lifer, *DC.*
7. Alysicarpus pubescens, *Law.*
8. Alysicarpus vaginalis, *DC.*
9. *Arachis hypogaea, *Linn.*
10. Astragalus h a m o s u s, *Linn.*
11. Astragalus m u l t i ceps, *Wall.*
12. Astragalus s a r cocolla, *Dymock.*
13. Astragalus strobiliferus, *Royle.*
14. Astragalus t r i buloides, *Delile.*
15. Astragalus virus, *Oliver.*
16. Butea frondosa, *Koen & Roxb.* See:—Butea monosperma, Erythrina monosperma.
17. Butea parviflora.
18. Butea superba, *Roxb.*
19. Cajanus bichlor.
20. Cajanus flavus.
21. *Cajanus indicus, *Spreng.* & Cajanus bichlor. Cajanus flavus.
22. Canavalia ensiformis, *DC.* Var:—Virosa, *Baker in Hook.* See:— Canavalia virosa.
23. Canavalia virosa. *W & A.* See:—Canavalia ensiformis.
24. *Cicer arietinum, *Linn.*
25. Cicer lens, See:—Ervum lens. Lens esculenta.
26. Clitoria marina.
27. *Clitoria ternatea, *Linn.* or Clitoria spectabilis.
28. Colutea a r b o rescens, *Linn.* See:—Colutea nepalensis.
29. Crotalaria albida, *Heyne.* or Crotalaria montana.
30. Crotolaria angulosa, or Crotolaria verrucosa.
31. Crotalaria b e n galensis. See:—Crotalaria juncea.
32. Crotolaria biflora, *Linn.*
33. Crotolaris burhia, *Hamilt.*
34. Crotolaria fenestrata.
35. Crotolaria fenninfolia.
36. *Crotolaria juncea, *Linn.* or Crotolaria bengalensis, or Crotolaria fenestrata, or Crotolaria fenninfolia.
37. Crotolaria medicaginea, *Lamk.*
38. Crotolaria p r o s trata, *Roxb.* or *Rattl.?*

82. Erythrina corallodendron, *Linn.*
83. *Erythrina indica, *Lam.* Erythrina stricta; *Roxb.* Erythrina corallodendron, *Linn.*
84. Erythrina monosperma, See:—Butea frondosa.
85. Erythrina stricta, *Roxb.*
86. Flemingia congesta, *Roxb.* See:—Flemingia nana.
87. Flemingia grahamana, *W. & A.*
88. Flemingia nana, *Roxb.* or Flemingia procumbiana; or Flemingia congesta.
89. Flemingia procumbiana, See:—Flemingia nana.
90. Flemingia strobolifera, *R. Br.*
91. Flemingia tuberosa, *Dalz.*
92. Galedupa indica, See:—Pongamia glabra, *Vent.*
93. Galega purpurea, *Linn.* See:—Tephrosia purpurea.
94. Glycine hispida, *Maxim.*
95. Glycine labialis, *Linn.* See:—Teramnus labialis, Spreng.
96. Glycine max, *Merr.*
97. Glycine soja. *Sieb & Zace.* & Glycine hispida, See:—Dolichos s o j a, *Linn.*
98. Glycyrrhiza glabra, *Linn.* Var:—Glycyrrhiza glandulifera, *Reg. et Hor. Linn.*
99. Glycyrrhiza glandulifera, See:—Glycyrrhiza glabra.
100. Hedysarum t u b e rosa, *Linn.* See:—Pueraria tuberosa, *DC.*
101. Indigofera anil, See:—Indigofera tinctoria; Indigofera indica; Indigofera sumatrana; Indigofera arrecta.
102. Indigofera argentea, *Linn.* See:—Indigofera articulata.
103. Indigofera arrecta, See:—Indigofera indica; Indigofera anil; Indigofera sumatrana; Indigofera tinctoria.
104. Indigofera a r t i culata. *Gouen.* See:—Indigofera argentea.
105. Indigofera aspalathoides, *Vahl.* See:— Lespedoza juncea.
106. Indigofera c a e r u l e a, *Roxb.*
107. Indigofera cardifolia,
108. Indigofera enneaphylla, *Linn.* See:— Indigofera semitrijuga.
109. Indigofera frutescens.
110. Indigofera galegoides, *DC.*
111. Indigofera glabra, *Linn.* See:— Indigofera pentaphylla.
112. Indigofera g l a n dulosa, *Willd.*
113. Indigofera hirsuta.
114. Indigofera indica. See:—Indigofera tinctoria; Indigofera anil; Indigofera sumatrana; Indigofera arrecta.
115. Indigofera linifolia, *Retz.*
116. Indigofera p a u cifolia, *Delile.* See:— Indigofera oblongifolia.
117. Indigofera p u l chella, *Roxb.*

157. Psophocarpus tetragonolobus, See:—Dolichos lablab, *Linn.*
158. Psoralea corylifolia, *Linn.* See:—Trifolium uniflorum.
159. Pterocarpus indicus, *Willd.*
160. Pterocarpus marsupium, *Roxb.* See:—Pterocarpus indicus, *Willd.*
161. Pterocarpus santalinus, *Linn.* See:—Pterocarpus lignum; Santalum rubrum.
162. Pueraria tuberosa, *DC.* See:—Hedysarum tuberosa.
163. Rhynchosia minima, *DC.*
164. Sesbania aculeata, *Pers.*
165. Sesbania aegyptiaca, *Poir.* or *Pers.* Var:—Picta. See:—Aeschynomena sesban.
166. *Sesbania grandiflora, *Pers.* See:—Agati grandiflora or olia.
167. Smithia gemminiflora. *Roth.* See:—Smithia conferta.
168. Soja hispida, *Moench.* See:—Glycine soja, *Sieb. & Zucc.*
169. Sophora tomentosa, *Linn.*
170. Spatholobus roxburghii, *Benth.*
171. Taverniera nummularia, *DC.* or *Baker.* See:—Taverniera cuncifolia.
172. Tephrosia hirta, *Ham.*
173. *Tephrosia purpurea, *Pers.* See:—Galega purpurea, *Linn.* (Sub-family).
174. Tephrosia villosa, *Pers.*
175. Teramnus labialis, *Spreng.* See:—Glycine labialis *Linn.*
176. Trachylobium hornemannianum, *Heyne.*
177. Trifolium indicum, *Linn.* See:—Melilotus parviflora, *Desf.*
178. Trifolium officinalis, *Willd.* See:—Melilotus officinalis *Willd.*
179. Trifolium pratense, *Linn.*
180. Trifolium repens, *Linn.*
181. Trifolium uniflorum, See:—Psoralea corylifolia.
182. Trigonella foenum-graecum, *Linn.*
183. Trigonella occulta, *Delile.*
184. Trigonella uncata, *Boiss.*
185. Uraria lagopoides, *DC.* See:—Doodia lagopoides or Uraria picta.
186. Uraria picta, *Desv.* See:—Doodia picta.
187. Vicia hirsuta, *Koch.*
187a. Vicia sativa, *Linn.* See:—Vicia angustifolia or V. angustifolia.
188. Vigna catiang, *Endl. & Walp.* See:—Dolichos catiang.
189. Zornia diphylla, *Pers.*

## 133. PASSIFLORACEAE.

1. Modecca palmata, *Lam.* See:—Adenia palmata, Modecca wightiana, *Wall.*
2. Modecca wightiana, *Wall.* See:—Modecca palmata, *Lam.* Adenia palmata.
3. *Passiflora foetida, *Linn.*

## 134. PEDALIACEAE.

1. Martynia diandra, *Glox.* See:—Martynia annua.

## 135. PHYTOLACCACEAE.



## 136. PINACEAE.



## 137. PIPERACEAE.



## 138. PITTOSPORACEAE.



## 139. PLANTAGINACEAE.

9. Plantago psyllium, *Linn.* See:—Povata.
10. Plantago pumila, *Willd.*
11. Plantago stocksii, *Boiss.*
12. Plantago tibetica. *HK. & T.*
13. Plantago orientalis, *Linn.*

## 140. PLUMBAGINACEAE.

1. Plumbago rosea, *Linn.*
2. Plumbago zeylanica, *Linn.* See:—P. ovata.
3. *Statice aegyptica, *Delile.*

## 141. POLYGALACEAE.

1. Polygala chinensis, *Linn.*
2. Polygala crotalarioides, *Ham.* See:—Polygala telephioides.
3. Polygala elongata, *Klein.*
4. Polygala erioptera, *DC.* Var:—Vahliana.
5. Polygala telephioides, *Willd.* See:—Polygala crotalarioides, *Ham.*
6. Polygala vulgaris, *Thumb.*

## 142. POLYGONACEAE.

1. Calligonum polygonoides, *Linn.*
2. Fagopyrum esculentum, *Gaertn.* or *Moench?*
3. Polygonum alatum, *Ham.* See:—Polygonum punctatum.
4. Polygonum aviculare, *Linn.* See:—Polygonum bistoria, & Polygonum viviparum.
5. Polygonum barbatum, *Linn.* See:—P. aviculare or rivulare.
6. Polygonum bistorta, *Linn.*
7. Polygonum cymosum, *Roxb.* See:—Fagopyrum cymosum, *Meissn.*
8. Polygonum glabrum, *Willd.* See:—Polygonum persicaria.
9. Polygonum hydropiper, *Linn.*
10. Polygonum flaccidum, *Rox. Treviran.* See:—Fagopyrum cymosum, *Meissn.*
11. Polygonum molle, *Don. & Brod.*
12. Polygonum persicaria, *Linn.* See:—Polygonum glabrum, *Willd.*
13. Polygonum plebejum, *R. Br.*
14. Polygonum rivulare or Polygonum aviculare? See:—Polygonum barbatum, *Linn.*
15. Polygonum viviparum, *Linn.*
16. Rheum acuminatum, *HK. f. & T.* Same as R. emodi.
17. Rheum emodi, *Wall.* See:—Rheum acuminatum; Rheum speciforme; Rheum webbianum; Rheum moorcroftianum; & Rheum australe.
18. Rheum moorcroftianum, *Royle.*
19. Rheum nobile, *Hk. f. & T.* See:—Rheum emodi.
20. Rheum officinale, *Baillon.*
21. Rheum palmatum, *Linn.*
22. Rheum webbianum, *Royle.* See:—Rheum emodi.
23. Rumex acetosella, *Linn.*

## 147. RANUNCULACEAE.

1. Aconitum balfourii, *Stapf*. See:—Aconitum ferox Varieties.
2. Aconitum chasmanthum, *Stapf*. See:— Aconitum napellus; Aconitum dissectum; Aconitum hians; Aconitum spicatum.
3. Aconitum deinorrhizum, *Stapf*. See:— Aconitum ferox; Aconitum atrox; Aconitum bruhlii; Aconitum laciniatum.
4. Aconitum falconeri, *Stapf*. See:—Aconitum ferox; & Aconitum dissectum.
5. Aconitum ferox, *Hook, Wall* or *Clegh?* Var: laciniatum & Atrox. *Watt*. See:—A. palmatum, Bruhl; A. deinorrhizum; A. polyschiza; ex. goris; A. balfourii; A. falconeri.
6. Aconitum heterophyllum, *Wall*. See:— Aconitum cordatum, *Royle;* Aconitum atees, *Royle;* Aconitum ovatum.
7. Aconitum cordatum, *Royle,* See:— Aconitum heterophyllum.
8. Aconitum hians, *Watt*. See:— Aconitum chasmanthum.
9. Aconitum laciniata, *Bruhl*. See— Aconitum laciniatum, *Stapf*. Aconitum ferox.
10. Aconitum luridum, *Hook*.
11. Aconitum lycoctonum, *Linn*.
12. Aconitum napellus, *Linn. & Stawart; Clegh?* Varieties:—A. multifidum; A. rigidum (partim); A. dissectum—*Duthie*. A. spicatum, *Duthie*. A. hians, *Goris & Watt*. See:—A. chasmanthum; A. ferox.
13. *Aconitum palmatum, *D. Don. & Hook*. See:—Aconitum ferox; Aconitum lethale; Caltha bisma; Nirbisia bisma.
14. Aconitum spicatum, *Stapf*. See:— Aconitum ferox, etc. etc.; Aconitum variegatum, *Hook;* Aconitum uncinatum, *Hook*.
15. Actaea racemosa.
16. Actaea spicata, *Linn*. See: —Actaea acuminata.
17. Adonis oestivalis, *Linn*.
18. *Anemone obtusiloba, *D. Don*. See:—Anemone discolor.
19. Caltha palustris, *Linn*. See:—Caltha himalensis; Caltha alba.
20. Cimicifuga foetida, *Linn*. See:—Cimicifuga frigida; *Royle*, or Actaea cimicifuga, *Linn*.
21. Cimicifuga racemosa, *Linn*.
22. Clematis gouriana, *Roxb*.
23. Clematis napaulensis, *DC*. See:—Clematis montana, *D. Don*.
24. Clematis smilacifolia, *Wall*. See:— Clematis munroana.
25. Clematis triloba, *Heyne*.
26. Clematis wightiana.
27. Coptis teeta, *Wall*.
28. *Delphinium ajacis, *Royle*.
29. Delphinium brunonianum, *Royle*. See:—Delphinium jacquemontianum; Delphinium moschatum.

## 148. RHAMNACEAE, or RHAMNEAE.

14. Zizyphus nummularia, *W. & A.* See:—Zizyphus microphylla.
15. Zizyphus oenoplia, *Mill.* See:—Rhamnus oenoplia.
16. Zizyphus rugosa, *Lamk.* See:—Zizyphus glabra.
17. Zizyphus sororia.
18. Zizyphus trinervia, *Roxb.* See:—Zizyphus glabrata.
19. Zizyphus vulgaris, *Lamk.* See:—Zizyphus sativa.
20. *Zizyphus xylopyrus, *Willd.*
21. Zizyphus zylopra, *Willd.* or Zizyphus xylopyrus, *Willd.*

## 149. RHIZOPHORACEAE.

1. Carallia lucida, *Roxb.*
2. Ceriops candollcana, *Arn.*
3. Khandalia rheedii, *W. & A.*
4. Rhizophora mangle, *Linn.*
5. *Rhizophora mucronata, *Lam. & Lamk.*

## 150. ROSACEAE.

1. Agrimonia eupatoria, *Linn.*
2. *Amygdalus communis, *Linn.* See:—Prunus amygdalus.
3. Brayera anthelmentica, *Kunth.*
4. Cerasus caproniana.
5. Cotoneaster buxifolia, *Wall.*
6. Cotoneaster microphylla, *Wall.*
7. Cotoneaster nummularia, *Fisch. & Mey.*
8. Crataegus oxycantha.
9. *Cydonia vulgaris, *Pers.* See:—Pyrus cydonia.
10. *Eriobotrya japonica, *Lindl.*
11. Gerish elatum.
12. Gerish urbanum.
13. Geum alatum, *Wall.*
14. Geum urbanum, *Linn.*
15. Hagenia abyssynica, *Lam.*
16. Potentilla fruticosa, *Linn.*
17. Potentilla kleiniana, *W. & A.*
18. Potentilla leschenaultiana.
19. Potentilla nepalensis, *Hook.*
20. Potentilla reptans, *Linn.* See:—Potentilla nepalensis.
21. Potentilla supina, *Linn.*
22. Prinsepia utilis, *Royle.*
23. Prunus amara, *DC.* See:—Prunus amygdalus, *Baillon.* Amygdalus communis, *Linn.* Prunus dulcis, *DC.*
24. *Prunus amygdalus, *Baillon.* Var:—1. Amara; 2. Dulcis. See:—Amygdalus communis, *Linn.*
25. *Prunus armeniaca, *Linn.* See:—Amygdala or Amygdalus vulgaris.
26. Prunus avium, *Linn.*
27. *Prunus cerasus, *Linn.*
28. Prunus communis, *Huds.* See:—Prunus institia, *Linn.*
29. *Prunus domestica, *Linn.* Var:—Prunus juliana.
30. Prunus dulcis, *DC.* See:—Prunus amygdalus, *Baillon.* Prunus amara; *DC.* Amygdalus communis, *Linn.*

## 151. RUBIACEAE.

ipecacunha *Linn.* Naregamia alata, *W. & A.*
7. *Cinchona calisaya, *Weddell.* See:—Cinchona ledgeriana.
8. Cinchona condaminea, *Linn.* See:—Cinchona officinalis.
9. Cinchona cortex.
10. *Cinchona officinale, or *Cinchona officinalis, *Linn. & Hook.* See:—Cinchona condeminea.
11. Cinchona robusta, *How.*
12. *Cinchona succirubra, *Paven.* See:—Cinchona pubescens.
13. *Coffea arabica, *Linn.*
14. Coffea bengalensis, *Roxb.*
15. Diplospora sphaerocarpa, *Hook.*
16. Galium aparine, *Linn.*
17. Galium mullugo, *Linn.*
18. Galium verum, *Linn.*
19. Gardenia campanulata, *Roxb.* See:—Gardenia gummifera. Gardenia florida.
20. Gardenia floribunada, *Roxb.*
21. Gardenia florida, *Linn.* See:—Gardenia gummifera; Gardenia campanulata.
22. *Gardenia gummifera, *Linn.* Gardenia arboria or arborica? Gardenia campanulata; Gardenia florida; Gardenia resiniferae.
23. *Gardenia lucida, *Roxb.* See:—Gardenia gummifora.
24. Gardenia turgida, *Roxb.*
25. Gardenia uliginosa, *Retz.* See:—Randia uliginosa.
26. Geophila reniformis, *Don.* Similar to Ipecacuanha.
27. *Hedyotis auricularia, *Linn.* See:—Hedyotis hispida; Oldenlandia auricularia.
28. Hedyotis hispida, *Retz.* See:—Hedyotis auricularia.
28a. Hedyotis indica, See:—Hedyotis umbellata; Hedyotis hispida.
29. Hedyotis umbellata, *Lamk.* See:—Oldenlandia umbellata *Linn.* Hedyotis hispida; Hedyotis indica.
30. Hymenodictyon excelsum, *Wall.* See:—Hymenodictyon obovatum.
31. Ixora alba, See:—Ixora parviflora, *Vahl.*
32. Ixora bandhuca, *Roxb.* See:—Ixora coccinea; Ixora grandiflora.
33. *Ixora coccinea, *Linn.* See:—Ixora grandiflora; Ixora bandhuca.
34. Ixora parviflora, *Vahl.* or Ixora alba.
35. Ixora pavetta, *Roxb.* See:—Pavetta indica.
36. Meynia spinosa, See:—Vangueria spinosa *Roxb.*
37. Morinda bracteata, See:—Morinda citrifolia, *Linn.* Morinda tinctoria, *Roxb.*
38. *Morinda citrifolia, *Bedd. & Linn.* See:—Morinda tinctoria, or Morinda bracteata.
39. Morinda concanensis, *Nimmo.*
40. Morinda scandens, See:—Morinda umbellata.
41. *Morinda tinctoria, *Roxb.* See:—Morinda citrifolia.

70. Rubia secunda. See:—Rubia cordifolia; Rubia munjista; Rubia tinctoria.
71. Rubia tinctorum, *Linn.*
72. Sarcocephalus cadamba, See:—Anthocephalus cadamba; Nauclea cadamba, *Roxb.*
73. Sarcocephalus horsfeldii, *Miq.*
74. Sarcocephalus missionis, *Wall & Haviland.*
75. *Spermacoce hispida, *Linn.* See:—Borreria hispida, *K. Sch.* & Spermacoce scabra.
76. Spermacosae stricta, See:—Paederia foetida; Convolvulus foetidus; Apocynum foetidum.
77. Stephegyne parviflora, *Korth.* See:—Mytragyna parvifolia, *Korth.*
78. Uncaria gambier, or gambir, *Roxb.* See:—Nauclea gambier.
79. *Vangueria spinosa, *Roxb.*
80. Webera tetrandra, *Wall.*

## 152. RUTACEAE.

1. Acronychia laurifolia, *Blume.* See:— Cyminosma pedunculata.
2. *Aegle marmelos, *Corr.*
3. *Atalantia monophylla, *DC or Corr?* See:—Atalantia floribunda.
4. Bergera konigii, or koenigii? *Linn.* See:—Murraya koenigii.
5. Chesia or Chalcas paniculata? See:—Murraya exotica, *Linn.* Murraya paniculata.
6. *Citrus acida, See:—Citrus medica, *Linn.* Citrus bergania.
7. *Citrus aurantium, *Linn.* Var:—Citrus aurantium, proper; Citrus bigaradia, & Citrus bergamia. See:—Citrus vulgaris.
8. Citrus bergamia, See:—Citrus acida.
9. Citrus bigaradia, *Duham.* See:—Citrus aurantium.
10. *Citrus decumana, *Murr. & Linn.* See:—Citrus maxima; Citrus acida.
11. *Citrus limetta, *W. & A.*
12. *Citrus limonum. See:—Citrus lemonum, & Citrus acida.
13. *Citrus medica, *Linn.* Var:—Citrus limonis; Citrus medica proper; Citrus limonum; Acida limetta. See:—Citrus acida.
14. Citrus vulgaris, *Risso.* See:—Citrus aurantium.
15. Crataeva vallangai, See:—Feronia elephantum.
16. Dictamnus albus, *Linn.*
17. Evodia meliaefolia, *Benth.* or mellaefolia?
18. Evodia roxburghiana, *Benth.* See:—Evodia lunurankenda.
19. Evodia rutaecarpa, *HK. f. & Th.*
20. *Feronia elephantum, *Correa.* or Anisiphalnis rumphii, or Crataeva vallangai.
21. Glycosmis cochin-chinensis, *Pierre.* See:—Glycosmis pentaphylla.
22. *Glycosmis pentaphylla, *Correa.* See:—Glycosmis cochinchinensis.

## 153. SACCHAROMYCES.

1. *Yeast (Latin:—Cerevisiae fermentum).
2. Yeast beer.
3. Yeast toddy.

## 154. SALICACEAE.

1. Populus ciliata, *Wall.*
2. *Populus euphratica, *Oliv.*
3. Populus nigra, *Linn.*
4. Salix acmophylla, *Boiss.* See:—Salix alba; *Linn.* Salix babylonica, *Linn.*
5. Salix alba, *Linn.*
6. Salix babylonica, *Linn.*
7. Salix caprea, *Linn.* See:—Salix tetrasperma.
8. Salix daphnoides, *Vill.*
9. *Salix tetrasperma, *Roxb.* See:—Salix caprea, *Linn.*

## 155. SALVADORACEAE.

1. Azima tetracantha, *Lam.*
2. Monita barberioides, See:—Azima tetracantha.
3. Salvadora indica, *Royle.*
4. *Salvadora oleoides, *Dcne.*
5. *Salvadora persica, *Linn.* See:—Salvadora indica, & Salvadora wightiana.

## 156. SAMYDACEAE.

1. Casearia esculenta, *Roxb.*
2. Casearia graveolens, *Dalz.*
3. Casearia tomentosa, *Roxb.* See:—Casearia elliptica.

## 157. SANTALACEAE.

1. *Osyris arborea, *Wall.* See:—Osyris wightiana.
2. *Santalum album, *Linn.*
3. Santalum rubrum. See:—Pterocarpus santalinus.

## 158. SAPINDACEAE.

1. Acer pictum, *Thunb.*
2. Aesculus hippocastanum, *Linn.*
3. Aesculus indica, *Hiern. & Colebr.* See:—Pravia indica.
4. Allophyllus serratus, *Radlk.* See:—Allophyllus cobbe.
5. *Cardiospermum halicacabum, *Linn.*
6. Dodonaea viscosa, *Jacq.* See:—Dodonaea angustifolia; Ptelea viscosa.
7. Litchi chinensis, *Sonner,* See:—Nephelium litchi, *Camb.*
8. Nephelium lappaceum, *Linn.*
9. Nephelium litchi, *Camb.* See:—Litchi chinensis.
10. Nephelium longana, *Camb.* See:—Euphorbia or Euphoria longana.
11. Sapindus detergens, *Roxb.* See:— Sapindus emarginatus; Sapindus laurifolia; Sapindus rubiginosus; Sapindus trifoliata; Sapindus mukorossi.
12. Sapindus emarginatus. See:—Sapindus trifoliata; Sapindus laurifolia; Sapindus rubiginosus; Sapindus mukorossi; Sapindus detergens.
13. Sapindus laurifolia, *Vahl.* See:—Sapindus trifoliata; Sapindus emarginatus;

16. *Costus speciosus, *Sm.* See:—Haplotaxis costus.
17. *Curcuma amada, *Linn. or Roxb.* or Curcuma matico.
18. Curcuma angustifolia, *Roxb.*
19. *Curcuma a r o m a tica, *Salisb.* Same as Curcuma longa.
20. Curcuma caesia, *Roxb.* See:—Curcuma l o n g a, *Roxb.*
21. Curcuma longa, *Linn. & Roxb.*
22. Curcuma zedoaria, *Rosc.* or Curcuma zerumbet; or Amomum zerumbet.
23. *Elettaria cardamomum, *Maton.* See:— Elettaria repens; Alpinia cardamomum.
24. Elettaria major, See:— Amomum subulatum.
25. Elettaria repens, See:— Elettaria cardamomum.
26. Hedychium spica t u m, *Ham.*
27. Hitchenia caulina, *Baker.*
28. Kaempferia angustifolia, *Rosc.*
29. Kaempferia g a l a n g a, *Linn.*
30. Kaempferia longa, See:— Kaempferia r o t u n d a, *Linn.*
31. *Kaempferia r o t u n d a, *Linn.* See:—Kaempferia longa.
32. *Maranta arundinacea, *Linn.*
33. Maranta galanga, See:— Alpinia galanga.
34. *Musa paradisiaca, *Linn.* See:—Musa sapientum, *Kuntze.*
35. *M u s a sapientum, *O. Kuntze. & Linn.* Same as M. paradisiaca.
36. *Ravenala madagascariensis.
37. Rascoea purpurea, *Royle.*
38. *Zingiber cassumunar, *Roxb.* See:— Zingiber purpureum; Zingiber cliffordii.
39. Zingiber cliffordii. See:— Zingiber cassumu n a r, *Roxb.* Zingiber purpureum.
40. *Zingiber officinalis or officinale, *Roscoe.*
41. Zingiber purpureum. See: —Zingiber cassumunar, *Roxb.* Zingiber cliffordii.
42. Zingiber zerumbet, *Rose & Smith.* Use same as Z. officinalis.

## 162. SCROPHULARIACEAE. or SCROPHULARINEAE

1. Anagallis arvensis, *Linn.* See:—Veronica anagallis.
2. Artanema sesamoides, *Benth & Wight.*
3. *Bonnaya veronicaefolia, *Wight & Spreng.* See:— Bonnaya reptans; Ilysanthes reptans.
4. Celsia caucasica, *Willd.*
5. Celsia cinnamomea, *Lindl.*
6. Celsia coromandeliana, *Vahl. & Wight.*
7. Curanga amara, *Juss.*
8. *Digitalis purpurea, *Linn.*
9. *Dopatrium j u n c e u m, *Ham.*
10. Dopatrium lobelioides, *Benth.*

## 162a. SIMAROUBACEAE.

10. Picrasma nephalensis, *Benn.*
11. Picrasma quassioides, *Benn.* See:—Nima quassioides; Simaba quassioides; Simaruba quassioides.
12. Quassia excelsa, or Quassia amara. See:—Picrasma excelsa; Simaruba excelsa.
13. Samadera indica, *Gaertn.* See:—Samadera pentapetala.
14. Samadera lucida, *Wall.* See:—Samadera indica.
15. Samadera pentapetala, See:—Samadera indica; Samadera lucida.
16. Simaruba excelsa, See:—Quassia excelsa, Picrasma excelsa.
17. Simaruba quassioides, See:—Picrasma quassioides; Nima quassioides.
18. Ximenia aegyptiaca, *Linn.* See:—Balanites roxburghii, *Planch.* Balanites aegyptiaca, *Del.*
19. Caulerpa crassifolia, and its other species.

## 163. SOLANACEAE.

1. Atropa acuminata, See:—Atropa mandragora; Mandragora officinarum; Mandragora autumnalis; Mandragora vernalis.
2. Atropa belladonna, *Linn.*
3. Atropa mandragora, See:—Atropa a c u minata; Mandragora autumnalis; Mandragora v e r nalis; Mandragora officinarum.
4. Capsicum a b b r e v i a t a, *Fingerh.*
5. Capsicum a c u minata, *Fingerh.*
6. *Capsicum annum, *Linn.* & Capsicum frutescens.
7. Capsicum baccata, *Irish,* or Capsicum baccatum.
8. Capsicum cerasiforme, or Capsicum cerasiformis? *Lamk.* or *Lank.* or *Bailey.*
9. Capsicum fastigiatum.
10. *Capsicum f r u tescens, *Linn.* See:— Capsicum minimum.
11. Capsicum grossum, *Willd.* or *Bailey.*
12. Capsicum longum, *Bailey.*
13. Capsicum m i n i m u m, *Roxb.* See:— Capsicum frutescens.
14. Capsicum nepalens, or Capsicum nepaleanse.
15. *Datura alba, *Ness & Wight.* See:—Datura fastuosa; Datura nigra (Stramonium); Datura metal; Datura nilhummatu.
16. *Datura fastuosa, *Linn. & Wight.* See:—D a t u r a alba.
17. Datura metal, *Linn.*
18. *Datura stramonium, *Linn.*
19. Hyoscyamus i n s a nus, *Linn.* See:—Hyoscyamus muticus, *Linn.*
20. Hyoscyamus m u t i cus, *Linn. & Mant.* or Hyoscyamus insanus.
21. Hyoscyamus niger, *Linn.* See:— Hyoscyamus aurens; Hyoscyamus reticularis.
22. Hyoscyamus p u s i l u s, *Linn.*
23. Hyoscyamus reticulatus, *Linn.*

58. *Solanum tuberosum.
59. *Solanum verbascifolium, *Linn. & Wight.*
60. Solanum virginionum, See:—Solanum jacquinii; Solanum xanthocarpum; Solanum diffusum.
61. *Solanum xanthocarpum, *Linn. & Schrad. & Wendl.* See:—Solanum jacquinii; Solanum virginionum; Solanum diffisum; Solanum trilobatum.
62. Withania coagulans, *Dunal.* See:—Puneeria coagulans *Stocks & Wight.*
63. *Withania somnifera, *Dunal.* See:—Physalis somnifera; Physalis flexuosa.

## 164. STERCULIACEAE.

1. Abroma augusta, *Linn.* or Abroma fastuosa; or Abroma fastuosum, *Linn.*
2. *Cola acuminata, *(Beauv.) Schott.*
3. Cola vera.
4. Eriolaena quinquelocucularis, *Wight.*
5. *Guazuma tomentosa, *H.B. & K. & Kunth.*
6. Helicteres isora, *Linn.*
7. *Melochia corchorifolia, *Linn.* See:—Riedleia corchorifolia.
8. Pentapetes phoenicea, *Linn.*
9. Pterospermum acerifolium, *Willd.*
10. Pterospermum glabrescens.
11. Pterospermum heyneanum, *Wall.*
12. Pterospermum suberifolium, *Lam.* See:—Pterospermum canescens.
13. Sterculia acuminata, See:—Cola acuminata.
14. Sterculia alata, *Roxb.* See:—Pterygota alata.
15. *Sterculia foetida, *Linn.*
16. Sterculia scaphigera, *Wall.* See:—Scaphium wallichii, *Schott. & Endl.*
17. *Sterculia urens, *Roxb.*
18. *Theobroma cacao, *Linn.*

## 165. STYRACEAE.

1. Styrax benzoin, *Dryand.* See:—Hopea racemosa.
2. Styrax Hookeri, *Clarke.*
3. Styrax officinale, *Linn.*
4. Styrax serrulatum, *Roxb.*

## 166. SYMPLOCACEAE.

1. Symplocos beddomei, See:—Hopea racemosa, Styrax benzoin, *Dryand,*
2. Symplocos crataegoides, *Ham.*
3. Symplocos racemosa, *Roxb.* See:—Symplocos theofolia.
4. Symplocos theofolia, See:-Symplocos racemosa, *Roxb.*

## 167. TACCACEAE.

1. Tacca aspera, *Roxb.* See:—Tacca lavis; Tacca pinnatifida.
2. Tacca lavis, *Roxb.* See:—Tacca aspera, *Roxb.* Tacca pinnatifida.

## 168. TAMARICACEAE.

1. Myricaria elegans, *Royle.*

2. Tamarix articulata, *Vahl.* See:—Tamarix orientalis, & Tamarix dioica.
3. Tamarix dioica, *Roxb.* See:—Tamarix gallica; & Tamarix articulata.
4. Tamarix gallica, *Dyer* or *Linn or Wight.* See:—Tamarix indica; Tamarix dioica; Tamarix troupii.
5. Tamarix indica, See:—Tamarix gallica.
6. Tamarix orientalis, See:—Tamarix articulata, *Vahl.*

## 169. TAMARISCINEAE.

1. Reaumuria hypericoides, *Willd.*

## 170. TERNSTROEMIACEAE.

1. Camellia thea, *Link.* See:—Camellia theifera; Camellia theasinensis.
2. Camellia theifera, *Griff & Hook,* See:—Camellia thea.
3. Gordonia obtusa, *Wall.*
4. Schima wallachii, *Chois.*
5. Thea assamica, See:—Camellia thea, or Camellia theifera, *Linn, Hook & Griff.*

## 171. THYMELACACEAE.

1. Aquilaria agallocha, *Roxb* See:—Aquilaria ovata.
2. Daphne oleoides, *Schreib.* See:—Daphne muchronata.
3. Lasiosiphon eriocephalus *Dcne.* See:—Gnidia eriocephala. Gnidia sisparensis.

## 172. TILIACEAE.

1. Corchorus antichorus, *Raeusch.* See:—Corchorus depressus.
2. Corchorus capsularis, *Linn.* & Corchorus trilocularis.
3. Corchorus clitorius, *Linn.*
4. Corchorus fascicularis, *Lam.*
5. Corchorus trilocularis, *Linn.*
6. *Elaeocarpus ganitrus, *Roxb.*
7. Elaeocarpus oblongus, *Gaertn.*
8. Elaeocarpus serratus, *Linn.*
9. Elaeocarpus tuberculatus, *Roxb.* See:—Monocera tuberculata.
10. *Grewia asistica, *Linn.* See:—Grewia elastica; Grewia tiliaefolia; Grewia vestita.
11. Grewia elastica, Var:—See:—Grewia asiatica; Grewia vestita; Grewia tiliaefolia.
12. Grewia hirsuta, *Vahl.* See:—Grewia polygama.
13. Grewia lancifolia, See:—Grewia polygama.
14. Grewia microcos, *Linn.* See:—Grewia umifolia.
15. Grewia orbiculata, *G. Don.* See:—Grewia villosa.
16. Grewia polygama, *Roxb. & Mast.* See:—Grewia lancifolia; & Grewia hirsuta.
17. Grewia salvifolia, See:—Alangium decapetalum.

18. Grewia scabrophylla, *Roxb.* See:—Grewia sclerophylla.
19. *Grewia tiliaefolia, *Vahl.* See:—Grewia asiatica.
20. Grewia vestita, See:—Grewia asiatica; Grewia elastica; Grewia tiliaefolia.
21. Grewia villosa, *Willd.* See:—Grewia orbiculata.
22. *Triumfetta rhomboidea, *Jacq.* See:—bartramia, *Linn.*

## 173. TYPHACEAE.

1. Typha angustifolia, *Linn.*

## 174. UMBELLIFERAE.

1. Anethum foeniculum, See:—Foeniculum vulgare.
2. Anethum graveolens, *Linn.* See:—Peucedanum graveolens.
3. Anethum sowa, *Roxb.* See:—Peucedanum sowa. *Kurz.* Peucedanum graveolens.
4. Anethum trifoliatum. See:—Pimpinella anisum.
5. Angelica glauca, *Edgew.*
6. Anthriscus cerefolium, *Hoffman.*
7. Apium graveolens, *Linn.*
8. Apium petroselinum. See:—Petroselinum sativum, *Linn.*
9. Carum ajowan or C. copticum, or carum roxburgianum. See:—Ptychotis ajowan.
10. Carum bulbocastanum, *Koch.* Similar to C. carui.
11. Carum carui or C. carvi, *B. P. Linn.* See:—C. nigrum; C. gracile. See:—Nigella sativa.
12. Carum copticum, *Benth & Hook.* See:—Ammi copticum; Carum roxburghianum. Ptychotis ajowan; Ptychotis coptica; Ptychotis roxburghianum.
13. Carum gracile. See:—Nigella sativa.
14. Carum nigrum. See:—Nigella sativa.
15. Carum roxburghianum, *Benth.* See:—Carum copticum; Ammi copticum; Ptychotis ajowan; Ptychotis coptica; Ptychotis roxburghianum; Apium involocratum.
16. Centella asiatica, *Urban.*
17. Conium maculatum, *Linn.*
18. Coriandrum sativum, *Linn.*
19. Cuminum cyminum, *Linn.* See:—Carum carui.
20. Cuminum nigrum, See:—Nigella sativa.
21. Daucus carota, *Linn.* See:—Daucus vulgaris.
22. Dorema ammoniacum, *Don.* See:—Dorema aureum; Dorema glabrum; Ferula orientalis; Ferula tingitana.
23. Dorema aureum, Stocks. resembles D. ammoniacum.
24. Eryngium coeruleum, *Bieb.*
25. Ferula alliacea, Boiss. Same as Ferula foetida.
26. Ferula asafoetida; F. foetida; Ferula alliaceae;

## 175. URTICACEAE.

8. Cannabis indica, See:—Cannabis sativa.
9. Cannabis sativa, *Linn.* See:—Cannabis indica.
10. *Celtis orientalis, *Linn.*
11. *Celtis reticulata, *Hk. f. & T.*
12. *Debregeasia velutina.
13. *Dorstenia indica, *Wall.*
14. *Ficus arbutifolia.
15. *Ficus arnottiana, *Miq.*
16. Ficus asperrima, *Roxb.*
17. *Ficus bengalensis, *Linn.* See:—Urostigma bengalense; Ficus indica.
18. Ficus benjamina, *Linn.* or Ficus comosa; or Ficus retusa.
19. *Ficus carica, *Linn.* See:—Psidium pomiferum.
20. Ficus comosa, See:—Ficus benjamina.
21. Ficus cunia, *Ham.* See:—Ficus conglomerata.
22. Ficus daemona, See:—Ficus hispida.
23. Ficus dalhousiae, *Miq.*
24. *Ficus elastica, *Roxb.*
25. *Ficus gibbosa, *Blume.* See:—Ficus tuberculata.
26. *Ficus glomerata, *Roxb.*
27. Ficus heterophylla, *Linn.* See:—Ficus scabrella.
28. Ficus hispida, *Linn.* See:-Ficus daemona; Ficus oppositifolia.
29. Ficus indica, See:—Ficus bengalensis.
30. *Ficus infectoria, *Roxb.* See:—Ficus lacor.
31. Ficus oppositifolia, *Willd.* See:—Ficus hispida.
32. Ficus palmata, *Forsk.* See:—Ficus virgata.
33. Ficus racemosa, See:—Ficus glomerata.
34. *Ficus religiosa, *Linn* See:—Urostigma religiosum.
35. *Ficus retusa, *Linn.* See:--Ficus benjamina.
36. Ficus ribes, *Reinw.*
37. *Ficus rumphii, *Blume.* See:—Ficus cordifolia.
38. *Ficus talboti, *King.*
39. Ficus tjakela, See:—Ficus infectoria.
40. *Ficus tsiela, *Roxb.*
41. Girardinia heterophylla, *Dcne.* Geronniera reticulata, *Thwaites.* Geronniera zeylanica.
42. *Gironniera reticulata, *Thw.*
43. *Holoptelea integrifolia, *Planch.* See:—Ulmus integrifolia.
44. Humulus lupulus, *Linn.*
45. *Laportea crenulata, *Gaud.* See:—Urtica crenulata.
46. *Morus alba, *Linn.* or Morus indica; Morus parviflora.
47. *Morus indica, *Linn.* See:-Morus alba; Morus parviflora.
48. Morus nigra, *Linn.*
49. Morus parviflora. See:—Morus alba; Morus indica.
50. *Pouzolzia indica, *Gaud.* See:—Pouzolzia diffusa; Pouzolzia procumbens; Urtica alienata.
51. *Streblus asper, *Laur. & Linn.* See:—Epicarpurus orientalis, & Trophis aspera.
52. *Trema orientalis, *Blume.*
53. Trophis aspera, See:—Streblus asper, *Linn.* Epicarpurus orientalis.

## 176. VALERIANACEAE.



## 177. VERBENACEAE.

14. Clerodendron siphonanthus, *R.Br.* See:—Premna herbacea.
15. *Gmelina arborea, *Roxb.*
16. *Gmelina asiatica, *Linn.* See:—Gmelina parviflora.
17. Gmelina parviflora, See:--Gmelina asiatica.
18. Lantana aculeata, *Linn.* See:—Lantana camara, *Linn.*
19. *Lantana camara, *Linn.* See:—Lantana aculeata.
20. Lantana indica, *Roxb. & Wight.*
21. *Lippia nodiflora, *Mich.*
22. Premna esculenta, *Roxb.*
23. Premna herbacea, *Roxb.*
24. Premna integrifolia, *Linn.* or Premna spinosa. See:—Premna sarratifolia.
25. Premna latifolia, *Roxb. & Wight.*
26. Premna mucronata, *Roxb.*
27. Premna serratifolia, *Linn.* See:—Premna spinosa; Premna integrifolia.
28. Premna spinosa, See:—Premna integrifolia, *Linn.* Premna serratifolia, *Linn.*
29. Premna tomentosa, *Willd.*
30. *Tectona grandis, *Linn.*
30a. Valkemeria inerme, *Linn.* See:—Clerodendron inerme, *R. Br. & Gaertn.*
31. Valkemeria multiflora, See:—Clerodendron, phlomoides, *Linn.*
31a. Verbena officinalis, *Linn.*
32. Vitex agnus-castus, *Linn.*
33. Vitex glabrata, *R. Br.*
34. Vitex latifolia.
35. Vitex leucoxylon, *Linn.* See:—Wallrothia leucoxylon.
36. *Vitex negundo, *Linn.* See:—Vitex paniculata.
37. Vitex paniculata, See:—Vitex negundo, *Linn.*
38. Vitex peduncularis, *Wall.* See:—Phaseolus roxburghii? or Putranjiva roxburghii?
39. Vitex trifolia, *Linn.*

## 178. VIOLACEAE.

1. Ionidium suffruticosum, *Ging.* See:—Viola suffroticosa, Ionidium enneaspermum.
2. Viola cinerea, *Boiss.* See:-Viola stocksii; V. serpens., Use same as V. odorata.
3. Viola odorata, *Linn.*
4. Viola serpens, *Wall.* See:—Viola cinerea, *Boiss.*
5. Viola tricolor, *Linn.*

## 179. VITACEAE.

1. Ampelocissus arnotiana, See:—Vitis indica, *Linn.*
2. Cissus adanata, or Cissus quadrangularis, & Cissus setosa; See:—Vitis adanata.
3. Cissus quadrangularis, *Linn.* See:—Vitis quadrangularis.
4. Cissus setosa, *Roxb.* See:—Vitis setosa.
5. Leea aequata, *Linn.* See:--Leea hirta, *Rox.*
6. Leea crispa, *Linn.*
7. Leea hirta, *Roxb.* See:—Leea aequata, *Linn.*

## 180. XYRIDACEAE.



## 181. ZYGOPHYLLACEAE.

## INDEX—LIST OF NATURAL ORDERS, GENERA & FAMILIES, APPEARING IN THIS BOOK, WITH THEIR RESPECTIVE ALTERNATIVES, ENGLISH AND INDIAN EQUIVALENT NAMES.

| | Natural Orders, Genera and Family Names. | English Families. | Indian orders. |
|---|---|---|---|
| 1. | Acanthaceae. | Acanthads or Acanthus. | Adusa. |
| 2. | Aizoaceae. | Weeds. | |
| 3. | Alangiaceae. | | |
| 4. | Algae. | Sea-weeds. | Chinai-ghas. |
| 5. | Alismaceae. | | |
| 6. | Amaranthaceae, or Amarantaceae. | Amaranths. | Cholai-bhaji, or Aghada. |
| 7. | Amaryllidaceae, or Amaryllideae. | Amaryllids. Amaryllus. | Sukadarsan. |
| 8. | Anacardiaceae. | Anacards; Terebinths or Sumaes. | Bhilmo or Kaju. |
| 9. | Annonaceae, or Anonaceae. | Custard-apple. | |
| 10. | Apocynaceae. | Dogbanes. | Satavari. |
| 11. | Araceae, or Aroidaceae. | Arads, or Arums. | Madanmasta, or Surana. |
| 12. | Araliaceae. | Ginseng. | |
| 13. | Aristolochiaceae, or Aristolochiae. | Birthworts. | Sapasana, or Kidamara. |
| 14. | Aroideae, See:— Araceae. | | |
| 15. | Asclepiadaceae, or Asclepiadeae. | Milkweeds. | Upalasari. |
| 16. | Ascomycetes. | | |
| 17. | Balsaminaceae. | Jewel-weed. | |
| 18. | Begoniaceae, or Begomaceae. | | |
| 19. | Berberidaceae, or Berberideae. | Barberry. | Daruhalada |
| 20. | Betulaceae. | Birch. | |
| 21. | Bignoniaceae, See:— Begoniaceae, etc. | Trumpet-creeper. | |
| 22. | Bixaceae, or | Chaulmogra. | Kesari. |

| Natural Orders, Genera and Family Names. | English Families. | Indian orders. |
|---|---|---|
| 55. Cyperaceae. | Sedges. | Nagarmotha. |
| 56. Datiscaceae. or Datisceae. | Akalbars. | |
| 57. Dilleniaceae. | | |
| 58. Dioscoriaceae. | Yams. | |
| 59. Dipsaceae, or Dipsacaceae. | Teasel. | |
| 60. Dipteraceae, or Dipterocarpeae, Dipterocarpaceae. | Sumatra camphor. | Garajan. |
| 61. Droseraceae. | Sundew. | |
| 62. Ebenaceae. | Ebony. | |
| 63. Elaeagnaceae. | | |
| 64. Equisetaceae. | | |
| 65. Ericaceae. | Heath. | |
| 66. Erythroxylaceae. | Coca. | |
| 67. Euphorbiaceae. | Spurgewords, or Spruce. | Erandi or Thuvara. |
| 68. Fagaceae. | Beech. | |
| 69. Ficoidaceae, or Ficoidae, or Aizoaceae. | | |
| 70. Flacourtiaceae. | | |
| 71. Florideae. | | |
| 72. Frankeniaceae. | | |
| 73. Fumeriaceae. | | |
| 74. Fungi. | Mushrooms. | Gharekuna or Phanasa-amba. |
| 75. Gentianaceae. | Gentian. | |
| 76. Geraniaceae. | Geranium. | |
| 77. Gnetaceae. | | |
| 78. Goodemaceae, or Goodeniaceae. | | |
| 79. Graminaceae, or | Grasses. | |
| 80. Gramineae? | | |
| 81. Guttiferae. | Guttifers, or Gamboge. | Kokama, or Mangostine. |
| 82. Haemodoraceae. | | |
| 83. Hamamelidaceae, or Hamamelideae, | | |
| 84. Helictereae. | | |
| 85. Hernandiaceae. | | |
| 86. Hydrocharitaceae. | | |
| 97. Hydrophyllaceae. | | |

| Natural Orders, Genera and Family Names. | English Families. | Indian orders. |
|---|---|---|
| 117. Myrsinaceae, or Myrsineae. | Ardisiads. | Vavadinga. |
| 118. Myrtaceae. | Myrtle, or Myrtleblooms. | Jambu. |
| 119. Naiadaceae. | | |
| 120. Nyctaginaceae. | | |
| 121. Nymphaeaceae. | Water-lilies. | Poini. |
| 122. Ochnaceae. | | |
| 123. Oleaceae. | Olive. | |
| 124. Onagraceae. | Evening Primrose. | |
| 125. Ophioglossaceae. | | |
| 126. Orchideae, or Orchidaceae. | Orchids. | Salamisari. |
| 127. Orobanchaceae. | | |
| 128. Oxalidaceae. | Sorrels. | |
| 129. Palmae, or Palmeae, Palmaceae, or Phoenicaceae. | Palms. | Sopari. |
| 130. Pandanaceae. | | |
| 131. Papaveraceae. | Poppy. | |
| 132. Papilionaceae. (Sub-family of Leguminosae.) | | |
| 133. Passifloraceae. | Passion Flower. | |
| 134. Pedaliaceae (See also Acanthaceae.) | Acanthus. | |
| 135. Phytolaccaceae. | | |
| 136. Pinaceae. (See also Coniferae.) | | |
| 137. Piperaceae. | Pepperworts; Pepper. | Pana or Pipali. |
| 138. Pittosporaceae. | | |
| 139. Plantaginaceae. | Ribworts; Plantago. | Isapoghula. |
| 140. Plumbaginaceae. | | |
| 141. Polygalaceae. | Milkworts. | |
| 142. Polygonaceae. | Buck-wheats. | Gul-i-hamaza. |
| 143. Polypodiaceae. | | |
| 144. Pontederiaceae. | | |
| 145. Portulacaceae. | | |
| 146. Primulaceae. | | |
| 146a. Punicaceae. | Pomegranate. | |

| Natural Orders, Genera and Family Names. | | English Families. | Indian orders. |
|---|---|---|---|
| 175. | Urticaceae, or Urticeae. | Nettleworts; Nettle. | Vada & Pipal. |
| 176. | Valerianaceae. | Valerian. | |
| 177. | Verbenaceae. | Verbenes or Varvains. | Nirgundi. |
| 178. | Violaceae. | Violets. | |
| 179. | Vitaceae, (See:—Ampelideae). | Grapes. | |
| 180. | Xyridaceae. | | |
| 181. | Zygophyllaceae. | Caltrop. | |

# INDEX LIST OF INDIAN PLANTS AND DRUGS FROM WHICH MOTHER TINCTURES AND EXTRACTS ETC., ARE PREPARED ACCORDING TO THE HOMOEOPATHIC SYSTEM OF MEDICINE.

*N. B.:—(1) In the doses column of this Index, "Q" indicates Mother Tincture.*

| | Doses of dilutions or potencies generally used. |
|---|---|
| 1. **Abroma augusta & Abroma radix.** *Preparation:* Tender roots and root barks are chopped and weighed. Then two parts by weight of alcohol are taken and after thoroughly mixing the mass with one-sixth part of it, the rest of alcohol is added. After stirring the whole well, put it into a wide-mouthed bottle, and let it stand eight days in a dark cool place. The tincture is then separated by decanting, straining and then filtering. (Class 3, A.H.P.) Tincture is also prepared with two parts by weight of alcohol to one part of leaves. (Class 3 of A. H. P.) | Q: 1x, 2x, 3x. both kinds. |
| 2. **Abrus precatorius.** | |
| 3. **Acacia arabica.** | Q: 1x, 2x, 3x. |
| 4. **Acalypha indica.** *Preparation:* (1) Fresh plant is macerated with two parts by weight of alcohol. (2) Tincture of fresh herbs made with spirits of ether, (3 Oz. to 1 pint). | Q: 1x, 2x, 3x, 6x. |

Doses of dilutions or potencies generally used.

5. **Acarus calamus.** Q: 1x, 2x, 3x.

6. **Achyranthes aspera, Linn.**
*Preparation:* Mother tincture is prepared from the juice of the leaves and branches according to the formula I of A. H. P.

7. **Adhatoda vasaka:** See:—Justicia adhatoda.

8. **Aegle marmelos.** (See:—Aegle folia).
*Preparation:* The half ripe or unripe fruit is finely chopped and pounded to a fine pulp and weighed. Then two parts by weight of alcohol are taken, and after thoroughly mixing the pulp with one-sixth part of it, the rest of the alcohol is added. After having stirred the whole, and having filled it into a well-stoppered bottle, it is allowed to stand for eight days in a dark, cool place. The tincture is then separated by decanting, straining and filtering. (Class 3, A. H. P.). It may also be prepared according to Class 4 of the American Homoeopathic Pharmacopoeia when the half-ripe dried fruits are reduced to coarse powder and weighed. Then five parts by weight of alcohol are poured upon it, and having been put into a well-stoppered bottle, the mixture is allowed to remain eight days in a dark, cool place, being shaken twice a day. The tincture is then poured off,

| | Doses of dilutions or potencies generally used. |
|---|---|
| strained and filtered.<br>*Aegle folia:* tinctures are also expressed by adding two parts of alcohol added to three parts of leaves. | Q: 1x, 2x, 3x, 6, 30 & 200 potencies of both varieties. |
| 9. **Ailanthus excelsa:** See:—Ailanthus malabarica. | Q: 1x, 2x, 3x. |
| 10. **Alocasia indica.** | 1x, 2x, 3x. |
| 11. **Aloe vera.** | Q: 1x, 2x, 3x. |
| 12. **Amoora rohitaka.** See:—Andersonia rohitaka. | |
| 13. **Andersonia rohitaka.** See:—Amoora rohitaka.<br>*Preparation:* The tincture is prepared from the bark. | Q: 1x, 2x, 3x, 6x; 30th potencies. |
| 14. **Andrographis paniculata.**<br>*Preparation:* Fresh plant is macerated with two parts by weight of alcohol. | Q: 1x, 2x, 3x, 6x, 30th & 200th potencies. |
| 15. **Argemone maxicana.** | Q: 3x, 6x. |
| 16. **Arjuna terminalia.** | |
| 17. **Arjuna tomentosa.** | |
| 18. **Asoka jonosia.** See:—Saraka indica; Jonosia asoka. | Q: of fresh plants. |
| 19. **Asparagus darmentises.** | Q: 1x, 2x. |
| 20. **Atista indica.** See:—Glycosmis pentaphylla.<br>*Preparation:* Juice of fresh leaves mixed with equal parts of alcohol. | Q: 1x, 2x, 3x, & 6 potencies. |

&

| | Doses of dilutions or potencies generally used. |
|---|---|
| **21. Atista radix.** *Preparation:* Tinctures prepared with two parts by weight of alcohol to one part barks of freshly collected roots. | 1x, 3x, 12 & 30 potencies. |
| **22. Avena sativa.** *Preparation:* Fresh green plant gathered in August, is pounded to a pulp and macerated with two parts by weight of alcohol. | |
| **23. Azadirachta indica.** See:—Melia azadirachta. *Preparation:* Tincture prepared with one part powdered bark and five parts by weight of alcohol. | Q: 1x, 2x, 3x, 6, 30 & 200 potencies. |
| **24. Blatta orientalis.** *Preparation:* The live cockroach is crushed and triturated as under Class IX of American Homoepathic Pharmacopoeia; a tincture can be prepared as under Class IV of the same Pharmacopoeia. | |
| **25. Blumea odorata.** | Q: 1x, 2x, 3x. |
| **26. Boerhavia diffusa.** *Preparation:* For tincture preparation, *the white variety only* should be used. | Q. |
| **27. Boerhavia repens.** *Preparation:* There are two kinds of *punarnava,* one with white and the other with red flowers. *The former is used in medicine.* The whole herb | |

Doses of dilutions or potencies generally used.

and root are taken. Tinctures expressed by the two parts of alcohol added to three parts of the substances. (Class 2 A. H. P.). — Q: 1x.

28. **Caesalpinia bonducella.** See:—Q u i n i a indica.

*Preparation:* Tincture is prepared with one part powdered seeds and five parts by weight of alcohol. (Class 4, A. H. P.). — Q: & 1x. 5 to 20 drop doses t w i c e or thrice daily.

29. **Cajanus indicus.**

30. **Calotropis alb.**

30a. **Cannabis indica, & Cannabis sativa.** — Q: 1x, 3x.

30.(b) **Calotropis gigantea.**

30.(c) **Calotropis lactum.** (Ghee of Calotropis gigantea).

*Preparation:* For preparation the root-bark should be selected from plants as old as possible in the hot ordinary weather and the bark should not be removed as soon as the root is dug out, but 24 hours afterwards, the thick, rough, corky epidermis of the bark should be scraped off before the root bark is reduced to powder. The recently-dried bark, coarsely pulvarised, is triturated as directed under Class VII A. H. P., or in preparing the tincture the root is finely powdered and covered with five parts by weight of alcohol as directed under Class — Q. tincture 1 to 5 drops per dose, three times a day.

| | Doses of dilutions or potencies generally used. |
|---|---|
| V, A. H. P. | 1x, 3x, 6x. |
| 31. **Carica papaya.** | Q: 1x, 2x, 3x. (Trit.) |
| 32. **Carum carui.** | Q. of fresh plant. |
| 33. **Carum copticum.** See:—Ptychotis ajowan. | Q, 1x, 2x, 3x. |
| 34. **Cassia angustifolia.** See:—Cassia sophera. | Q, 1x, 2x, 3x. |
| 35. **Cassia sophera.** See:—Cassia angustifolia. | Q, 1x, 2x, 3x. |
| 36. **Cephalandra indica.** *Preparation:* The entire fresh plant including roots, leaves, fruits, and barks are chopped and pounded to a pulp; is enclosed in a piece of new linen and subjected to pressure. The expressed juice is then, by brisk agitation mingled with an equal part by weight of alcohol. The mixture is allowed to stand eight days in a well-stoppered bottle, in a dark cool place, and is then filtered. | Q, 1x, 2x, 3x. |
| 37. **Chaulmoogra odorata.** See:— *Gynocardia odorata; Hydnocarpus wightiana; Taraktogenos kurzii; & Hydnocarpus hetrophilleas.* *Preparation:* The powdered seeds one part with five parts by weight of alcohol. If a potency from oil is necessary, then take one drop of chaulmoogra oil and nine grains of sugar of milk (ix) which should be triturated | Dose of the oil is from 5 to 6 drops, gradually increased to bined with 30 drops of cod liver oil or pregiven after meals in emulsion with gum acacia and syrups or in milk or comferably in cap- |

| Entry | Preparation | Doses of dilutions or potencies generally used. |
|---|---|---|
| | according to Class VIII of the A. H. P. | 30 minims, sules. |
| **38. Clerodendron inerme, or Clerodendron nerifolium.** | | Q. |
| **39. Clerodendron infortunatum.** | *Preparation:* Tincture is prepared from the juice of fresh leaves mixed with equal parts of alcohol by weight. | Q; 1x, 2x, 3x, 6 & 30 potencies. |
| **40. Cocculus cordifolius, & Cocculus indica.** | | Mostly Q. |
| **41. Coleus aromaticus.** See:—Bryophyllum C. | *Preparation:* The juice of the leaves is mixed with equal parts of alcohol by weight. | Q in 10 to 30 drop doses. 1x, & extract. |
| **42. Cynodon dactylon.** | *Preparation:* Fresh juice of the entire grass (herb) and root stock is mixed with equal parts of alcohol by weight. | Q; 1x, 2x, 3x. |
| **43. Datura fastuosa.** | | |
| **44. Desmodium gangeticum.** | | Q; 1x, 2x, 3x, 6x, 30 potencies. |
| **45. Embelia ribes.** | *Preparation:* One part of the dried fruits (pulverised) with five parts by weight of alcohol. | Q; 1x, of fresh plant. |
| **46. Enthydra fluctuans.** | | |
| **47. Eugenia jambolana.** See:—Syzygium jambolanum. | | |
| **48. Eupatorium ayapana.** See:—Eupatorium nerifolia. | | Q; 1x, 2x, 3x. |

| | Doses of dilutions or potencies generally used. |
|---|---|
| 49. **Feronia elephantum.** | Q; of fresh fruit. |
| 50. **Ficus bengalensis;** or Ficus indica. | Q; 1x, 2x, 3x; 6 potencies. |
| 51. **Ficus religiosa.** *Preparation:* Tincture is prepared from juice of fresh leaves mixed with equal parts of alcohol. (Class I, A. H. P.). | Q; 1x, 2x, 3x, 6 & 30 potencies. |
| 52. **Ficus venosa.** | |
| 53. **Gentiana chirata,** & Gentiana kurroo; See:—Swertia chirata; Andrographis paniculata. | |
| 54. **Glycosmis pentaphylla;** or Atista indica or Atista radix. *Preparation:* Juice of fresh leaves is mixed with equal parts of alcohol. | Q; 1x, 3x, 6 potencies. |
| 54. **Glycyrrhiza glabra.** | Q; of fresh plant. |
| 55. **Gossypium herbaceum.** | Q; 1x, 2x, 3x. |
| 56. **Gymnema sylvestre.** | Q; 1x, 2x, 3x. |
| 57. **Gynocardia odorata,** See:—Hydnocarpus wightiana, or Hydnocarpus hetrophilleas, or Taraktogenos kurzii; See:—Chaulmoogra odorata. | |
| 58. **Hemidesmus indicus.** *Preparation:* Tincture prepared with two parts by weight of alcohol to one part of freshly collected roots. | Q; 1x, 2x, 3x. 6 & 30 potencies. |
| 59. **Holarrhena antidysentirica;** See:—Wrigh- | |

| | Doses of dilutions or potencies generally used. |
|---|---|
| tia tinctoria.<br>*Preparation:* Tincture prepared with one part powdered bark and five parts by weight of alcohol. (Class IV, A. H. P.). | Q; 1x, 2x, 3x, & 6 potencies. |
| **60. Hydnocarpus series, & Taraktogenos kurzii**; Hydnocarpus inebrians; Hydnocarpus wightiana; Hydnocarpus hetrophilleas. See:—Gynocardia odorata; Chaulmoogra odorata. | |
| **61. Hydrocotyle asiatica.**<br>*Preparation:* The whole plant including leaves, fruits and roots are finely chopped and weighed. To every three parts, two parts by weight of alcohol are taken, the whole is mixed together and strained through a piece of new linen. The tincture thus obtained is allowed to stand eight days in a well stoppered bottle in a cool place and then filtered. | Q; 1x, 2x, 3x, 6x; 30; 200; 1000. |
| **62. Hydrocotyle indica.** | |
| **63. Hygrophila spinosa.**<br>*Preparation:* The entire fresh plant with its roots is macerated with two parts by weight of alcohol. | Q; 1x, 2x, 3x, 6x, 30. |
| **64. Jonosia asoka**; See:—Saraca indica.<br>*Preparation:* The mother tincture should be prepared from the dried bark according to Class IV of American Homoeopathic Pharmacopoeia. | Q; 1x, 3x. |
| **65. Justicia adhatoda; See:**—Adhatoda vasaka. | |

| | Doses of dilutions or potencies generally used. |
|---|---|
| *Preparation:* Fresh leaves are macerated with two parts by weight of alcohol. | Q; 1x, 2x, 3x. |
| **66. Justicia rubrum.** *Preparation:* As Justicia adhatoda. Dilutions and potencies used like Justicia adhatoda. | Q; 1x, 2x, 3x. |
| **67. Lathyrus sativus.** | Q; 1x. |
| **68. Leucus aspera.** *Preparation:* Juice of the entire plant in-  cluding flowers, roots, and leaves is mixed with equal parts of alcohol. (Class I, A. H. P.). | Q; 1x, 3x. Extract. |
| **69. Leucus cephalotes.** | |
| **70. Luffa acutangula.** | Q; 1x, 2x, 3x. |
| **71. Luffa amara.** *Preparation:* The tincture is prepared according to Formula I of A. H. P. | 1x, 3x, 6. |
| **72. Luffa bindal.** *Preparation:* In the preparation of the tincture, Formulae I of A. H. P., is adopted. | 1x, 3x, & 6x. |
| **73. Makaradhwaja.** *Preparation:* One part by weight of the Makaradhwaja to nine parts by weight of sugar of milk gives the ix trituration. All following triturations are prepared with one grain of the preceding trituration to | Trit. 1x. 2x 3x, 6 & 30. |

Doses of dilutions or potencies generally used.

nine grains of sugar of milk.

74. **Melia azadirachta,** or Azadirachta indica.
*Preparation:* The fresh bark is pounded to a pulp and macerated into two parts by weight of alcohol. — 6, 30, & 200 potencies.

75. **Menispernum. (Ben:—Raktha-Kathalia).**
*Preparation:* Formula No. 1 of the A. H. P. is adopted. — Q; 1x, 2x, 3x, 6x.

76. **Mica.**

77. **Momordica charantia.**
*Preparation:* The leaves of the fresh plant are chopped and pounded to a pulp and pressed out in a piece of new linen. The expressed juice is then, by brisk agitation, mingled with an equal part by weight of alcohol. This mixture is allowed to stand eight days in a well-stoppered bottle, in a dark, cool place, and then filtered.

78. **Nerium psidium.**

79. **Nyctanthes arbortristis.**
*Preparation:* Tincture prepared with two parts of alcohol added to three parts of fresh leaves, which should be finely chopped and weighed. — Q; 1x, 2x, 3x.

80. **Ocimum caryophyllatum.** — 1x, 3x, 6x.

80a. **Ocimum gratissimum.**
*Mode of preparation:* As Ocimum sanctum. — 1x, 3x, 30.

| | Doses of dilutions or potencies generally used. |
|---|---|
| **81. Ocimum influenzinum.** | |
| **82. Ocimum sanctum.** Ocimum radix (root). *Preparation:* Tincture expressed by the aid of two parts of alcohol added to three parts of blooming plant. (Class II, A. H. P.). | Q; 1x, 2x, 3x. |
| **83. Oldenlandia corymbosa,** or Oldenlandia herbacea. *Preparation:* Fresh plant is macerated with two parts by weight of alcohol. | Q; 1x, 2x, 3x, 6x, 30. |
| **84. Pausinystalia yohimba.** | Q; 1x, 2x, 3x. |
| **85. Piper betle.** | Q; of fresh plant. |
| **86. Plumbago rosea.** | Q; 1x, 2x, 3x. |
| **87. Psoralea corylifolia.** *Preparation:* Pulverised seeds, one part and five parts of alcohol, (by weight). | |
| **88. Ptychotis ajowan.** See:—Carum capticum. | |
| **89. Quinia indica,** & Quinia folia. See:—Caesalpinia bonducella. | Q; 1x, 2x, 3x. |
| **90. Rauwolfia serpentina.** *Preparation:* Tinctures prepared with two parts by weight of alcohol to one part of freshly collected roots. (Class 3, A. H. P.). | Q; 1x, 2x, 3x. |
| **91. Saraca indica,** or Jonosia asoka. *Preparation:* The mother-tincture is prepared from the dried bark according to Class IV of | Q; 1x, 3x. |

| A. H. P. | Doses of dilutions or potencies generally used. |
|---|---|
| **92. Saussurea lappa.** *Preparation:* One part powdered roots with five parts by weight of alcohol. | Q. |
| **93. Sesbania aculeata.** | Q; 1x, & Extract. |
| **94. Solanum jacquinii,** or Solanum xanthocarpum. | |
| **95. Solanum xanthocarpum.** See:—Solanum jacquinii. *Preparation:* The fresh plant including root is macerated with two parts by weight of alcohol. | Q; 1x, 3x. |
| **96. Swertia chirata.** See:—Gentiana chirata; Gentiana kurroo; Andrographis paniculata. *Preparation:* Tinctures expressed by the two parts of alcohol added to three parts of the entire plant. | Q; 1x, 2x, 3x. |
| **97. Syzygium jambolanum,** or Eugenia jambolana. *Preparation:* Tincture is prepared from dried seeds according to Formula IV of the A. H. P. | Q; 1x, 2x, 3x. |
| **98. Taraktogenos kurzii,** See:—Gynocardia odorata; Hydnocarpus wightiana; or Hydnocarpus hetrophilleas; Chaulmoogra odorata. | |
| **99. Terminalia arjuna.** *Preparation:* One part of the dried bark (pulverised) with five parts by weight of alcohol. (Class IV of A. H. P.). | Q; 1x, 3x. |

| Drug and preparation | Doses of dilutions or potencies generally used. |
|---|---|
| **100. Terminalia chebula.** *Preparation:* Tincture is prepared from the outer covering of the fruits and seeds according to Class IV of the A. H. P. | 1x, 3x, 6x, 30 potencies. |
| **101. Tinospora cordifolia.** *Preparation:* Tincture is prepared with one part plant and five parts by weight of alcohol. (Class IV of A. H. P.). | Q; 1x, 3x, 6x. |
| **102. Tribulus terrestris.** *Preparation:* Tincture prepared with one part powdered root and fruits and five parts by weight of alcohol. | 10 to 20 drops of the tincture 3 times daily. |
| **103. Trichosanthes dioica.** *Preparation:* One part of the roots is macerated in two parts by weight of alcohol, according to Class III of the A. H. P. | Q; 1x, 2x, 3x, 6x, 30. |
| **104. Vernonia anthelmintica.** *Preparation:* One part powdered seeds with five parts by weight of alcohol. | Q; 3x. |
| **105. Vitex negundo.** | |
| **106. Withania somnifera.** *Preparation:* Pulverise dried roots of *Aswagandha;* mix it with alcohol in the preparation (by weight) of one to five, and place the mixture in a dry, cool place for seven days. Shake it well every morning and evening. The tincture is then poured off, strained and filtered. It is | |

| | | |
|---|---|---|
| | | Doses of dilutions or potencies generally used. |
| | better to wrap the bottle containing the mixture with a black broad cloth. | |

**107. Wrightia tinctoria.** See:—Holarrhena antidysenterica.

| | | |
|---|---|---|
| *Preparation:* | The tincture is prepared with one part of powdered bark with five parts by weight of alcohol. Class IV, A. H. P. | Q; 1x, 3x, 6x. |

*Publications referred.*


1. Drugs of Hindoosthan (2nd Edn.) by Dr. S. C. Ghose.
2. Drugs of India, (4th Edn. 1940) by Dr. D. Chatterjee.
3. Use of Indian Tincture, (1st Edn.) pub. by Homoeo-Chemical & Pharmaceutical Works, Ltd., Calcutta.

# INDEX OF PREPARATIONS, COMBINATIONS, SUBSTANCES AND ALLIED PRODUCTS OF ALL KINDS APPEARING IN "THE INDIAN MATERIA MEDICA":—

N. B.:—(1) Letters M and A preceding the numbers in this Index stand for *Mineral & Animal Kingdoms'* pages respectively, and plain numbers indicate the *Vegetable Kingdom* pages.

(2) A few substances etc., indexed hereunder may be found indexed in the General Index of Synonyms, Alkaloids, Glucosides, etc., and vice versa, to facilitate cross reference.

*(2) Though a very vast number of Indigenous & Foreign modes of Preparations etc. are extant, Readers will find samples of the following types and modes of Preparations etc., in this book:—*

1. Abhrakams.
2. Abhras.
3. Amritas.
4. Anjanas or Anjans. (Surmas; Collyriums).
5. Aquae (Waters).
6. Araks.
7. Aristas & Arishtas.
8. Asavas.
9. Ashes (Bhasmas).
10. Ashtakas.
11. Attars.
12. Avalehas, see:—Lehas.
13. Baths.
14. Beers.
15. Bhairabs.
16. Bhasmas (Ashes).
17. Biscuits.
18. Blisters.
19. Breads.
20. Cakes.
21. Cataplasms.
22. Chatnies or Chutneys.
23. Chintamanies.
24. Churnas; Churnams; (Powders).
25. Chutneys or Chatnies.
26. Collyriums.
27. Compounds.
28. Confections (Majoons).
29. Conserves.
30. "Daru" (see:—Liquers etc.).
31. Decoctions.
32. Depilatories.
33. Douches.
34. Dravakams.
35. Elixirs.
36. Embrocations.
37. Esters.
38. Extracts.
39. Fishes.
40. Foods.
41. Fumigations.
42. Ghees, see:—Ghritams; Ghritas.
43. Ghritas; Ghritams; Ghees.

---

---

# INDEX OF CHEMICAL CONSTITUENTS
## (Major & Minor, significant & insignificant) in the main text of the "INDIAN MATERIAL MEDICA"

**N.B.: Letters "A" & "M" preceding the Numbers hereunder, stand to indicate pages of the Animal & Mineral Kingdoms respectively; plain numbers are of the Vegetable Kingdom.**

---

---

---

---

---

---

# GENERAL INDEX CUM-CROSS-INDEX OF SYNONYMS (IN ALL LANGUAGES, DIALECTS ETC.) IN THE "INDIAN MATERIA MEDICA.

N. B.—1 *LETTERS "A" AND "M" preceding the Numbers hereunder, indicate pages of the Animal and Mineral Kingdoms respectively. Plain NUMBERS stand for the Vegetable Kingdom's pages.*

N. B.—2 *FOR SCIENTIFIC NAMES AND SYNONYMS OF MINERAL AND ANIMAL substances refer to the 'SUBJECT-INDEX of the Mineral and Animal Kingdoms" preceding this Index.*

---

Nellatiga, 674—See:—Tiga (varieties)

---

---